

# GS-01005

## General Supplemental Specifications for Highway and Bridge Construction

Effective Date  
October 21, 2003  
(Replaces GS-01004)

**THE STANDARD SPECIFICATIONS, SERIES OF 2001, ARE AMENDED BY THE FOLLOWING MODIFICATIONS, ADDITIONS, AND DELETIONS. THESE ARE GENERAL SUPPLEMENTAL SPECIFICATIONS AND SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.**

**NOTE: Changes made since the previous GS issue are indicated by shading in the Table of Contents, in the instruction line, and in the text. Previous changes have been incorporated and are no longer called out by shading or strikeout.**

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## **Division 11. General Requirements and Covenants.**

### **Section 1101**

#### **1101.02, Definitions of Abbreviations**

**Replace** "ACT" with "ACI" in the list of abbreviations.

#### **1101.03, Definition of Terms**

**Add** definitions:

**Completion Date.**

The date on which all work specified in the contract is completed.

**Optionally Combined Proposal.**

The projects from two or more proposals combined by the Contracting Authority to allow the Contractor to bid all the projects as one contract.

**Responsible Bid.**

A bid submitted by a Contractor which is determined not to be an irregular proposal as defined by Article 1102.10 and fulfills the good faith effort recruitment requirements in Article 1102.17.

### **Section 1102**

#### **1102.01, C, CPA Audit Statement**

**Replace** the third sentence of the second paragraph:

However, a prospective bidder shall be considered to have an "Unlimited" bidding capacity with the Department if they were awarded over \$50 million of work (including that from other Contracting Authorities) during their past fiscal year and have a prequalification limit, by the formula, over \$100 million.

#### **1102.04, Contents of Proposal Forms**

**Replace** the second paragraph:

The statement, "By virtue of statutory authority preference will be given to products and provisions grown and coal produced within the State of Iowa where applicable," which is on the bidding document shall not be applicable to contracts involving Federal-aid participation in construction.

#### **1102.09, Preparation of Proposals**

**Replace** the second sentence of the first paragraph:

For bids submitted to the Department that exceed \$600,000, the Contractor shall use subparagraph B or subparagraph C below. The Department may wave this requirement for unique or isolated situations.

#### **1102.09, B (following the first paragraph)**

**Delete** the word "Expedite".

#### **1102.09, C (following the first paragraph)**

**Replace** the entire paragraph:

Submit an electronic bid with digital signature using the bidding software furnished by the Department using the electronic bid submittal procedures of the Department.

#### **1102.11, Proposal Guaranty**

**Replace** the first sentence of the first paragraph:

Each proposal shall be supported by a proposal guaranty in the form and amount prescribed in the proposal.



**Replace** the last sentence of the second paragraph:

Certified checks and credit union share drafts shall be certified, or the cashier's check shall be drawn and endorsed, in an amount not less than prescribed in the proposal.

**Replace** "Form 650041" with "Form 650043" in the first sentence of the last paragraph.

### **1102.12, Filing of Proposal**

**Add** second paragraph:

The Contracting Authority may take bids on the same project as an individual proposal or part of an Optionally Combined Proposal. When an Optionally Combined Proposal is designated, the consideration for award of contracts will be based on which of the following gives the lowest total cost:

1. The sum of the lowest responsible bid on each of the individual proposals.
2. The lowest responsible bid on the Optionally Combined Proposal.

### **1102.13, Withdrawal of Proposal**

**Add** after the first paragraph:

The bidder will be permitted to withdraw their proposal under the following three conditions:

- A.** The bidder may withdraw a proposal unopened if such a request is made in writing and received at the Department prior to the time specified in the advertisement for receiving bids. A proposal so withdrawn may be resubmitted as long as it is resubmitted prior to the deadline for receipt of bids.
- B.** If, after bids are open, the low bidder should claim a serious error in the preparation of the bid, and can support such a claim with evidence satisfactory to the Department, the bidder may be permitted to withdraw the bid and the bid guarantee may be returned. In such an event, action on the remaining bids will be considered as if the withdrawn bid had not been received. Under no circumstances will the bidder be permitted to alter the bid after the bids have been opened.

The Department will keep the bidder's proposal guarantee unless the bidder satisfies all four of the following conditions:

1. The mistake must be a clerical mistake as opposed to a mistake involving poor judgment concerning a construction process. The bidder must be able to produce bid preparation documentation to show how the clerical error occurred.
  2. The bidder must immediately notify the Department as soon as the error is observed.
  3. The scope of the mistake must be significant. The size of the mistake when compared to the overall project must be significant enough to cause major financial difficulties if the bidder is forced to complete the project at the price quoted.
  4. The Department should not be placed in a worse position than if the bid had never been submitted.
- C.** The bidder may withdraw their bid from consideration if a contract has not been offered them within 30 calendar days after the letting and the bidder has not requested approval for award be deferred.

### **1102.17, D, 3, c, Contractors with History of Utilizing DBEs**

**Replace** the first two paragraphs:

A bidder who has demonstrated their ability to utilize DBE firms on both Federal-aid and non-Federal-aid projects let by the Department in the 24 months prior to the letting will be assumed to have made a Good Faith Effort to achieve the project goal.

The Department's objective evaluation of prior usage of DBE firms will include all contracts let by the Department that were awarded to the Contractor during the 24 months prior to the letting. The calculation will include the sum of the following:

**1102.17, D, 3, c, 1**

**Replace** the first paragraph:

- 1) One point for each percentage of average DBE subcontracted dollars for the 24 months prior to the letting (e.g. an average 7.5% dollars subcontracted to DBE equals 7.5 points)

**1102.18, C, Positive TSB Effort Documentation**

**Add** as the second paragraph:

On proposals where a specific TSB goal has been established, the Contractor will be required to submit the TSB form with their bid. The TSB form will be provided by the Contracting Authority and used to document the TSB participation that shall be attained. The Contracting Authority will determine if the bidder has made adequate Good Faith Effort to meet the established goal. Bidders who fail to make such Good Faith Effort may have their bid rejected on the basis of being non-responsive to meeting the established TSB goal.

**1102.19, C, 4, Payment to Trainees.**

**Replace** the title and entire article:

**Payment to of Trainees.**

On contracts with a predetermined wage rate, trainees must be paid at least the journeyman's wage unless the trainee is enrolled in an approved U.S. Department of Labor (DOL) training program. Trainees in approved U.S. DOL training programs shall be paid by the Contractor at least 60% of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75% for the third quarter of the training period, and 90% for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the U.S. DOL or Iowa DOT. Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this training specification.

**1102.19, D, 5, Placement of EEO/AA Notices and Posters**

**Replace** entire article:

**5. Placement of EEO/AA Notices and Posters.**

The Contractor shall place the following notices and posters on a bulletin board at the project site in areas readily accessible to employees and potential employees. In addition, the Contractor shall be responsible for obtaining the following documents from each subcontractor whose subcontract equals or exceed \$10,000 and for posting the document on the project's bulletin board:

- a. Notice providing provided by the Iowa DOT listing the names, addresses, and phone numbers of the Contractor's EEO/AA Officers and all approved subcontractors.
- b. Training letter indicating whether the Contractor has an employee training and promotion plan. If such a plan is offered, the letter shall identify training entrance requirements. If such a plan is not offered, the letter shall indicate that there is no plan, see Article 1102.19, C, for additional information.
- c. Contractor's EEO operating statement, see Article 1102.19, B.
- db. Form EEOC-P/E-1, stating "Equal Employment Opportunity is THE LAW".
- ec. Form FHWA-1022, regarding any false statement, false representation, false report, or false claim made in connection with any Federal or Federal-aid highway or related project.
- fd. Form FHWA-1495, regarding wage rate information for a Federal-aid highway project, required only if Davis/Bacon predetermined wage rates apply to the project.
- ge. Current Iowa Predetermined Wage Rate Decision, identifying Davis/Bacon predetermined wage rates for the State of Iowa. The wage rate decision shall be arranged on a bulletin board so that all wage rate and classification information is visible.

**f. IOSH 30 Safety and Health Protection on the Job.**

**g. WH-1420 Your Rights Under the FMLA Act of 1993.**

**h. WH-1462 Notice: Employee Polygraph Protection Act.**

**hi.** Form FHWA-1495A (Spanish version of form FHWA-1495), stating "Informacion Sobre Escalas De Salarios Proyecto De Carretera Con Ayuda Federal", required only if Davis/Bacon predetermined wage rates apply to the project.\*

**ij.** Form EEOC-P/S-1 (Spanish version of form EEOC-P/E-1), stating "La Igualdad de Oportunidades De Empleo Es LA LEY".\*

\* These forms are not required, but it is strongly recommended that these two Spanish notices be posted whenever the company employs and/or anticipates receiving applications from those who speak Spanish.

~~In addition, the Contractor shall be responsible for obtaining the following documents from each subcontractor whose subcontract equals or exceed \$10,000 and for posting the document on the project's bulletin board:~~

~~a. Notice providing the name, address, and phone numbers of the subcontractor's EEO/AA Officer.~~

~~b. Training letter indicating whether the subcontractor has an employee training and promotion plan. If such a plan is offered, the letter shall identify training entrance requirements. If such a plan is not offered, the letter shall indicate that there is no plan, see Article 1102.19, C, for additional information.~~

~~c. Subcontractor's EEO operating statement, Article 1102.19, B, for additional information.~~

All required postings, ~~Contractor's and subcontractor's,~~ shall be in place when work commences on a project and shall remain in place through completion of the project.

Progress payments to the Contractor ~~may be suspended if will not be made until~~ these notices and posters are ~~not~~ displayed at the required site.

### 1102.19, F, 1, c, 3

Replace "Article 1102.19/F, 2, b" with "Article 1102.19, F, 2, b".

## Section 1104

### 1104.09, Right-of-Way

**Add** as last sentence of Article:

Permission of the property owner may be necessary to access some parcels prior to the letting.

## Section 1105

### 1105.04, Conformity with and Coordination of the Contract Documents

**Replace** the list in **Article 1105.04**, Conformity with and Coordination of the Contract Documents:

1. Addendum
2. Proposal Form
3. Special Provision
4. Plans
5. Developmental Specification
6. Supplemental Specifications
7. Standard Specifications
8. Materials I.M.

**1105.06, Construction Stakes**

**Add** as first sentence of first paragraph:

Minimum standards for Construction Survey provided by the Engineer will meet the requirements of Section 2526.

**Section 1106****1106.01, Source of Supply and Quality Requirements**

**Replace** "Materials I.M.s 209 and 210" with "Materials I.M.s 209 and 213" in the fourth paragraph.

**Section 1107****1107.07, Safety, Health, Pollution, and Sanitation**

**Delete** the second paragraph:

~~A safety inspection will be required at the beginning of each major phase of the operation. Repeated inspections may be necessary for phases of long duration. All safety inspections shall be made and reported by the Contractor's safety officer, even though that phase of the operation may be subcontracted. The times of these inspections should be identified at the preconstruction conference or before work is started. The Engineer shall be given reasonable notice with an opportunity to witness the inspection, and the Engineer shall receive a copy of a written report.~~

**Section 1108****1108.01, Subletting of Contract**

**Replace** the second paragraph with a new second and third paragraph:

Except for the furnishing and transportation of materials, no portion of the contract shall be sublet, assigned, or otherwise disposed of except with written consent of the Contracting Authority. Where a subcontract has been approved, the approved subcontractor shall be responsible to complete that portion of the contract with its own organization.

Where a subcontract does not exist, but a DBE firm is manufacturing, supplying, or trucking materials to the job site; terms of the agreement shall be described and documented on the Subcontract Request and Approval form (Form 830231). This will assure the Engineer that a Contractor is meeting commitments previously stated on the Statement of DBE Commitments form (Form 102115). This dollar value will not be used to determine the percent subcontracted as specified previously. Where Davis/Bacon wage requirements apply, the Contractor shall be responsible for collecting and submitting certified payrolls for all drivers. Owner/operators shall be listed on the certified payrolls as owner/operators.

**Add** as the second sentence of the last paragraph:

For contracts that exceed \$600,000, the Contractor shall submit the Subcontract Request and Approval form electronically using the software furnished by the Department.

**1108.02, D, Charging of Working Days**

**Replace** the first paragraph:

The Contractor will be charged working days as defined in Article 1101.03 and this article. For multiple site contracts, working day charges for each site will be charged independently based on the controlling operation for the site.

**Add** this indented paragraph after the numbered list in the second paragraph:

However, working days will not be charged prior to 15 calendar days after the contract has been signed by the Contracting Authority, as long as the Contractor furnished the signed contract, performance bond, and proof of insurance within the time allowed by Article 1103.07; and has not begun work on the contract.

**Add** as first two sentences of fourth paragraph:

The Contractor will be charged 1/2 working day when weather or other conditions beyond the control of the Contractor permit work for at least 1/2 but less than 3/4 of a working day. The Contractor will not be charged a working day when weather or other conditions beyond the control of the Contractor prevent work less than 1/2 of a working day.

**Delete** the third paragraph:

~~For multiple site contracts, working day charges for each site will be charged independently based on the controlling operation for the site.~~

**Section 1109**

**1109.01, B, 1, b, 1, Section 4151 Steel Reinforcement**

**Add** after the last paragraph:

All hard converted \* metric reinforcing steel (bar size matrix shown on plans) may be substituted with English reinforcing steel or soft converted \* metric steel as follows:

\*NOTE: Hard Converted metric size reinforcing steel refers to bars referenced in ASTM A 615/A 615 M - 95b using the following sizes: 10, 15, 20, 25, 30, 35, 45, and 55.

Soft Converted metric size reinforcing steel refers to bars referenced in ASTM A 615/A 615 M - 96a using the following sizes: 10, 13, 16, 19, 22, 25, 29, 32, 36, 43, and 57.

Hard Converted* Metric Size	English Size	Soft Converted* Metric Size
10	4	13
15	5	16
20	6	19
25	8	25
30	10	32
35	11	36

The spacing or pattern of bar placement shall be as shown in the contract documents, and no changes in the spacing or the pattern will be allowed with the substitution.

**1109.05, A, Progress Payments**

**Replace** the first two sentences of the first paragraph:

For work extending over a period of more than one month, the Contractor will receive monthly progress estimate payments based on the amount of work completed in an acceptable manner. For primary and secondary projects in which the Contracting Authority is the Department or a county Board of Supervisors, these progress payments will be bi-weekly if requested by the Contractor.

**1109.07, Certified Statement of Sales Tax and Use Tax Paid**

**Replace** the entire article:

On all projects, except on the Interstate and Primary Systems, before final payment can be made on a contract, the Contractor and subcontractors shall file a certified statement on forms provided by the Contracting Authority. These forms show the amount of Iowa sales tax and use tax paid by them on all materials which have become a component part of the finished, completed contract and on such supplies for this construction as were actually consumed on this work.

If the material is purchased in Iowa, the Contractor/subcontractor shall pay Iowa sales tax on the purchase price of the material. If material is purchased outside Iowa, but deliverable to a point in Iowa, the Contractor shall pay Iowa sales tax, unless sales tax equal to or greater than the Iowa rate was collected in another state. If no sales tax or sales tax at a rate less than the Iowa rate was collected in another state, the Contractor/subcontractor shall pay Iowa sales tax on the purchase price of the material for the difference to equal the Iowa rate.



These statements shall be submitted in duplicate to the Engineer in charge of the project at the completion of the contract.

Contractors and approved subcontractors will be provided a Sales Tax Exemption Certification to purchase building materials, supplies, or equipment in the performance of construction contracts let by the Department.

## **Division 20. Equipment Requirements.**

## **Division 21. Earthwork, Subgrades, and Subbases.**

### **Section 2102**

#### **2102.05, Rock Cuts**

**Add** new paragraph:

The contract documents may require that part or all of the Class 12 Excavation be crushed. When crushing is required, the contract documents will specify the size and/or gradation the rock shall be crushed to, and specify where the crushed material is to be stockpiled or used in the contract.

#### **2102.13, G, Crushing of Class 12 Excavation**

**Add** as Paragraph G:

##### **G. Crushing of Class 12 Excavation.**

The quantity in cubic yards (cubic meters) shown in the contract documents for Crushing of Class 12 Excavation will be the volume paid. Prior to the start of this work, if either the Engineer or the Contractor desires actual measurement the Engineer will determine in cubic yards (cubic meters) the quantity of Class 12 Excavation that will be crushed computed from the cross section measurements by the average end area method based on soil borings.

#### **2102.14, D, Special Backfill Material**

**Add** a second paragraph:

The contract will have a separate item for Special Backfill, Place Only, in tons (Mg) or cubic yards ( $m^3$ ), when the Contracting Authority is providing the material or if the material is available from mandatory crushing of pavement or pavement scarification on the contract. The cost of crushing or pavement scarification should be included in the Contractor's price for special backfill if recycling is not required but the Contractor chooses to crush the pavement removed or scarify the HMA surfacing for special backfill.

#### **2102.14, G, Crushing of Class 12 Excavation**

**Add** as Paragraph G:

##### **G. Crushing of Class 12 Excavation.**

The Contractor will be paid the contract unit price per cubic yard (cubic meter) for the volume of Class 12 Excavation crushed.

### **Section 2103**

#### **2103.04, A**

**Replace** "5%" with "50%" in the second paragraph.

**Replace** "0.05" with "0.50" in the equation in the second paragraph.

#### **2103.04, B**

**Replace** "5%" with "50%" in the second paragraph.

**Replace** "0.05" with "0.50" in the equation in the second paragraph.

## Section 2107

### 2107.10, Rock Fills

Replace “ow” with “below” in the third sentence of the second paragraph.

### 2107.14, Use of Unsuitable Soils

Replace “RL-1” with “RL-1B” in the first sentence.

## Section 2111

### 2111.06, Construction of Granular Subbase

**Add** as the last two sentences of the last paragraph:

The granular subbase may be placed in areas where the Engineer and the Contractor agree it is reasonable to expect pavement construction can be accomplished prior to winter shutdown. The trimming of the granular subbase shall be restricted to 1 mile (1.6 km) ahead of the paving operation when winter shutdown is eminent.

### 2111.09, Basis of Payment

**Add** as the second and third sentences of the first paragraph:

The contract will have a separate item for Granular Subbase, Place Only, in square yards (m<sup>2</sup>), when the Contracting Authority is providing the material or if the material is available from mandatory crushing on the contract. The cost of crushing should be included in the Contractor's price for granular subbase if recycling is not required but the Contractor chooses to crush the pavement removed for granular subbase.

## Section 2115

### 2115.02, Materials

**Replace** the entire article:

~~Material for modified subbase shall consist solely, or in combinations, of crushed PCC pavement, crushed composite pavement, crushed stone, sand, or gravel meeting the following requirements for Gradation No. 14 of the Aggregate Gradation Table in Section 4109.~~

~~Recycled crushed PCC pavement, crushed composite pavement, and salvaged HMA shall be reclaimed from an Interstate or Primary roadbed under the jurisdiction of the Contracting Authority. Certified RAP, recycled PCC pavement, or recycled composite pavement obtained from other sources may be used.~~

~~Crushed products meeting the requirements of this specification may be uniformly blended with a maximum of 50% RAP pavement meeting the requirements of Article 2303.02. RAP shall be processed such that 100% of the material is a nominal 2 inches (50 mm) maximum size. It shall be the Contractor's responsibility to furnish material that has a sufficiently stable quality to resist distortion during subbase and pavement construction and to provide satisfactory drainage.~~

~~Not more than 50% sand and/or uncrushed gravel may be uniformly blended with crushed PCC pavement, crushed composite pavement, or crushed stone to meet the required gradation. If gravel only is provided no less than 75% of the material retained on 3/8 inch (9.5 mm) or larger sieves must be crushed. Crushed content of gravel, for purposes of this specification, is defined as the percentage of particles, by weight (mass), as visually observed to have a minimum of one fractured face.~~

~~The following requirements apply to both blended and non-blended virgin materials:~~

#### **A. Freeze and Thaw, and Abrasion Loss.**

~~Aggregates shall have a percentage of wear, Grading A or B, not exceeding 45%, determined in accordance with AASHTO T 96, and loss not exceeding 15% when subjected to freezing and thawing test, Iowa DOT Materials Laboratory Test Method 211, Method C. Crushed stone with an aluminum oxide~~

content not greater than 0.7% as determined by x-ray fluorescence (Iowa DOT Materials Laboratory Test Method 222) and an abrasion loss not exceeding 55% when tested in accordance with AASHTO T 96, Grading A or B, may be provided.

**B. Clay Content.**

Carbonate aggregate passing a No. 40 (4.25 mm) sieve shall not exceed 4.7% by weight (mass) of aluminum oxide as determined by x-ray fluorescence. Crushed carbonate aggregates may be blended to achieve an aluminum oxide content of 4.7% or less.

For gravel or gravel/non-gravel blended products, the plasticity index of each individual source shall not exceed 7. An aluminum oxide content of 4.7 or less as determined by x-ray fluorescence may be applied in lieu of plasticity index determination for carbonate aggregates when blended with gravels.

Article 4123.01 shall apply.

**2115.06, Basis of Payment**

**Add** as the third and fourth sentences of the first paragraph:

The contract will have a separate item for Modified Subbase, Place Only, in cubic yards (m<sup>3</sup>), when the Contracting Authority is providing the material or if the material is available from mandatory crushing on the contract. The cost of crushing should be included in the Contractor's price for modified subbase if recycling is not required but the Contractor chooses to crush the pavement removed for modified subbase.

**Section 2121**

**2121.05, A, Earth Shoulder Fill**

**Replace** the first sentence:

This work involves construction of a shoulder fill to such elevation below that of the pavement edge as to allow for placement of granular shoulders as shown in the contract documents.

**Add** as the second and third sentences:

Material shall be select treatment materials of Article 2102.06, A, 1, if available and coordinated with the Engineer, or suitable soils of Article 2102.06, A, 2. Material shall not be unsuitable soils of Article 2102.06, A, 3, or topsoil.

**2121.07, C, Winter Shutdown**

**Add** entire new article:

**C. Winter Shutdown.**

Granular shoulder material shall be brought up to the pavement edge for the full width of the shoulder, at the design cross slope, prior to winter shutdown.

**2121.09, Basis of Payment**

**Add** as the last paragraph:

The contract will have a separate item for Granular Shoulders, Place Only, of the type specified in tons (Mg), when the Contracting Authority is providing the material or if the material is available from mandatory crushing on the contract. The cost of crushing should be included in the Contractor's price for granular shoulders if recycling is not required but the Contractor chooses to crush the pavement removal for granular shoulder material.

**Section 2122**

**2122.02, A, Type B Hot Mix Asphalt Mixture**

**Replace** the title and sentence:

**A. Hot Mix Asphalt Mixtures.**

HMA 1,000,000 ESAL base mixture shall be of materials specified in Section 2303.

**2122.04, Preparation of Shoulder Area**

**Replace** the first paragraph:

This work may involve construction of an earth fill and a special backfill to allow placement of paved shoulders. The earth fill shall be spread and compacted in accordance with the requirements of Section 2109. Material shall be select treatment materials of Article 2102.06, A, 1, if available and coordinated with the Engineer, or suitable soils of Article 2102.06, A, 2. Material shall not be unsuitable soils of Article 2102.06, A, 3, or topsoil.

**2122.07, Method of Measurement**

**Replace** the entire article.

The quantities of the various classes of work involved in the construction of paved shoulders of the width and thickness specified, satisfactorily completed, will be measured for payment as follows:

**A. Paved Shoulders.**

Paved shoulders will be the quantity computed by the Engineer in square yards (square meters) from surface measurement of the completed work. Paved shoulders will be measured as follows:

**1. Hot Mix Asphalt Paved Shoulder.**

Article 2303.05, A, 2, shall apply. The quantity of Hot Mix Asphalt Paved Shoulder, in square yards (square meters), will be the quantity shown in the contract documents.

**2. Portland Cement Concrete Paved Shoulder.**

Article 2301.34, A, shall apply. For small projects for which there would be only one lot of each width and these lots would be approximately 600 square yards (500 m<sup>2</sup>) or less, or for areas of irregular shape the Engineer will determine compliance in accordance with Article 1105.04. The quantity of Portland Cement Concrete Paved Shoulder, in square yards (square meters), will be the quantity shown in the contract documents. Thickness determination will be in accordance with Article 2301.34, A.

**B. Special Backfill.**

The quantity for payment for special backfill shall be the contract quantity.

**C. Resurfacing or Overlay of Existing Paved Shoulders.**

When existing paved shoulders are resurfaced, the Engineer will measure the quantity in tons (megagrams).

**1. Hot Mix Asphalt Resurfacing.**

Article 2303.05, A, 1, shall apply.

**2. Asphalt Binder.**

Article 2303.05, B, shall apply.

**2122.08, A, Paved Shoulders**

**Delete** the first paragraph.

For the number of square yards (square meters) of paved shoulders of the type, width, and thickness specified, satisfactorily constructed, the Contractor will be paid the contract unit price per square yard (square meter), as follows:

**2122.08, C, 1, Hot Mix Asphalt Resurfacing**

**Replace** "Article 2303.06" with "Article 2303.06, A".

**2122.08, C, 2, Asphalt Binder**

**Replace** "Article 2303.06" with "Article 2303.06, B".

## Section 2123

### 2123.02, Construction

**Replace** the second sentence:

Material deposited above an elevation 6 inches (150 mm) below subgrade elevation shall be select treatment materials of Article 2102.06, A, 1, if available and coordinated with the Engineer, or suitable soils of Article 2102.06, A, 2.

**Add** as the third sentence:

Material shall not be unsuitable soils of Article 2102.06, A, 3, or topsoil.

### 2123.04, A, Earth Shoulder Finishing

**Replace** the first paragraph.

The Engineer will compute the length of earth shoulder finishing in stations (meters) by measuring along each shoulder. The quantity of Earth Shoulder Finishing, in stations (meters) along each edge of the pavement, will be the quantity shown in the contract documents.

### 2123.04, B, Earth Shoulder Construction

**Replace** the first sentence.

The Engineer will compute from measurement along each edge of pavement the number of stations (meters) of earth shoulder construction. The quantity of Earth Shoulder Construction, in stations (meters) along each edge of the pavement, will be the quantity shown in the contract documents.

### 2123.05, Basis of Payment

**Delete** the first paragraph.

For the quantity of earth shoulder finishing or earth shoulder construction, measured as provided above, the Contractor will be paid as follows:

### 2123.05, A, Earth Shoulder Finishing

**Replace** the first sentence.

For work covered by an item for Earth Shoulder Finishing, the Contractor will be paid the contract unit price for excavation per cubic yard (cubic meter) for excavation, as provided in Article 2102.14, A, and for Earth Shoulder Finishing per station (meter) of Earth Shoulder Finishing.

### 2123.05, B, Earth Shoulder Construction

**Replace** the first sentence.

For work covered by an item for Earth Shoulder Construction, the Contractor will be paid the contract unit price for Earth Shoulder Construction per station (meter).

## Division 22. Base Courses.

### Section 2201

### 2201.03 Method of Measurement and Basis of Payment

**Replace** "Article 2301.34 and Article 2301.35" with "Article 2301.34, A, and Article 2301.35, A".

## Section 2213

### 2213.14, Method of Measurement

**Replace** the entire article.

The Engineer will measure the quantities of the various items in connection with construction of the Base Widening in accordance with the following provisions:



**A. Removal of Curb.**

The length in stations (meters) of single curb removed will be measured to the nearest foot (meter). The quantity of curb removed, in stations (meters), to the nearest foot (meter), will be the quantity shown in the contract documents.

**B. Removal of Flumes.**

The Engineer will determine by count the number of flumes removed. The quantity of flumes removed will be the quantity shown in the contract documents.

**C. Excavation, Class 13, for Widening.**

The quantity of trench excavation for Base Widening will be the quantity shown in the contract documents as Class 13 excavation.

**D. Hot Mix Asphalt Base Widening.**

HMA base used for base widening will be measured in accordance with Article 2303.05, A.

**1. Hot Mix Asphalt Base Widening.****a. Measurement by Weight (Mass).**

The quantity of Hot Mix Asphalt Mixture for Base Widening used will be measured in accordance with Article 2303.05, A, 1.

**b. Measurement by Area.**

The quantity of Hot Mix Asphalt Mixture for Base Widening, of the depth specified, used will be measured in accordance with Article 2303.05, A, 2.

**2. Portland Cement Concrete Base Widening.**

The quantity of Portland Cement Concrete for Base Widening, of the depth specified, used will be measured in accordance with Article 2301.34, A.

**E. Asphalt Binder.**

Article 2303.05, B, shall apply.

**F. Primer or Tack Coat Bitumen.**

Article 2303.05, E, shall apply.

**G. Samples.**

Article 2303.05, H, shall apply for HMA base widening. Article 2301.34, I, shall apply for PCC base widening.

**H. Portland Cement Concrete Base Widening**

PCC used for base widening will be measured in accordance with Article 2301.34, A.

**2213.15 Basis of Payment****Replace the entire article.**

For construction of the various items involved in Base Widening, computed as specified above, the Contractor will be paid in the following manner:

**A. Removal of Curb.**

For the number of stations (meters) of single curb removed, the Contractor will be paid the contract unit price per station (meter). The Contractor will be paid the contract unit price for Removal of Curb per station (meter).

**B. Removal of Flumes.**

For the number of flumes removed, the Contractor will be paid the contract unit price for each. This payment shall include all necessary backfilling in the areas where no grading is provided. The Contractor will be paid the contract unit price for Removal of Flumes per each unit.

**C. Excavation, Class 13, for Widening.**

For the number of cubic yards (cubic meters) of Class 13 excavation for trench excavation stated in the contract, the Contractor will be paid the contract unit price per cubic yard (cubic meter). This payment shall include removal of bituminous fragments, boulders, and broken concrete in accordance with Article 1104.08.

**D. Hot Mix Asphalt Base Widening.**

~~HMA base used for base widening will be paid in accordance with Article 2303.06, A.~~

**1. Hot Mix Asphalt Base Widening.****a. Measurement by Weight (Mass).**

The Contractor will be paid the contract unit price for Hot Mix Asphalt Mixture for Base Widening in accordance with Article 2303.06.

**b. Measurement by Area.**

The Contractor will be paid the contract unit price for Hot Mix Asphalt Mixture for Base Widening, of the depth specified, in accordance with Article 2303.06.

**2. Portland Cement Concrete Base Widening.**

The Contractor will be paid the contract unit price for Portland Cement Concrete for Base Widening, of the depth specified, per square yards (square meters).

**E. Asphalt Binder.**

Article 2303.06, B, shall apply.

**F. Intentionally left blank.****G. Samples.**

HMA base widening samples will be paid for in accordance with Article 2303.06, F. PCC base widening samples will be paid for in accordance with Article 2301.35, I.

**H. Portland Cement Concrete Base Widening.**

~~PCC used for base widening will be paid in accordance with Article 2301.35, A.~~

~~Sand cover aggregate used with tack coats will not be paid for separately.~~

~~When the Contractor is allowed the option of widening material described in Article 2213.01, the widening work will be shown on the proposal as Base Widening. The area of Base Widening constructed will be measured and paid for in square yards (square meters) as provided in Article 2303.05, A, and Article 2303.06, A; items for HMA base, asphalt binder, and primer or tack coat bitumen will neither be shown on the proposal nor be paid for separately. The area of Base Widening constructed with PCC will be measured and paid for in square yards (square meters) as provided for pavement widening in Article 2302.13, C, and Article 2302.14, C; items for pavement widening, joint sealing, contraction joints, and expansion joints will neither be shown on the proposal nor be paid for separately. The quantity of Class 13 excavation for trench excavation will not be adjusted because of the widening material used.~~

**Section 2214****2214.01, Description****Replace** the second paragraph:

If material suitable for recycling is to be scarified, the contract documents may identify the quality of that material. When scarified material is suitable for HMA recycling, the contract documents will show bid items by weight (mass), except for small quantities which may be shown by area. When the scarified material is not suitable for recycling, the contract documents will show bid items by area and removed from the project as directed in the contract documents.

**2214.05, Limitations**

**Add** as the eighth paragraph:

When resurfacing is part of the contract, all scarified surfaces shall be covered with at least one full lift of HMA prior to winter shutdown. The Contractor shall leave no vertical edges or fillets.

**2214.06, Method of Measurement**

**Replace** the entire article.

Pavement scarification, satisfactorily completed, will be measured by weighing the material removed or by area as indicated in the contract documents. When measured by weight (mass), the Engineer will compute the quantity from scale weights (mass) of the material scarified and salvaged. When measured by area, the Engineer will compute the quantity from the length of scarification and the nominal scarified width.

The Engineer will compute the length of Blading and Shaping Shoulder material completed on each shoulder.

**A. Pavement Scarification.****1. Measurement by Weight (Mass).**

When measurement is by weight (mass), the quantity of Pavement Scarification will be expressed in tons (megagrams) and determined from the quantity of scale weights (mass) of the material salvaged.

**2. Measurement by Area.**

When measurement is by area, the quantity of Pavement Scarification, square yards (square meters), will be the quantity shown in the contract documents.

**B. Blading and Shaping Shoulder Material.**

The quantity of Blading and Shaping Shoulder Material, in stations (meters), along each edge of the pavement, will be the quantity shown in the contract documents.

**2214.07, A, Payment for pavement scarification will be as follows:**

**Replace** the title and entire article.

**A. Payment for pavement scarification will be as follows: Pavement Scarification.****1. Material Suitable for Recycled Asphalt Pavement.**

When scarified material is suitable for HMA recycling, the Contractor will be paid the contract unit price per ton (megagram) for the quantity removed.

When scarification involves removal of a small quantity of asphalt material, the Contractor will be paid the contract unit price per square yard (square meter) for the area of scarification completed. As directed in the contract documents, salvaged material shall be incorporated in the project or stockpiled.

**2. Material Not Suitable for Recycled Asphalt Pavement.**

When the scarified material is not suitable for recycling, the Contractor will be paid the contract unit price per square yard (square meter) for the scarification completed. Scarified material shall be removed from the project as directed in the contract documents.

**1. Measurement by Weight (Mass).**

The Contractor will be paid the contract unit price for Pavement Scarification per ton (megagram).

**2. Measurement by Area.**

The Contractor will be paid the contract unit price for Pavement Scarification per square yards (square meters).

**2214.07, B, Blading and Shaping Shoulder Material**

**Replace** the entire article.

~~When this work is included in the contract, for the number of stations (meters) of Blading and Shaping Shoulder Material completed, the Contractor will be paid the contract unit price per station (meter). The Contractor will be paid the contract unit price for Blading and Shaping Shoulder Material per station (meter).~~

**Section 2217****2217.05, Method of Measurement**

**Replace** the entire article.

~~The Engineer will measure the total area of Rubblized Pavement in square yards (square meters). The quantity of Rubblized Pavement, in square yards (square meters), will be the quantity shown in the contract documents.~~

**2217.06, Basis of Payment**

**Replace** the first sentence.

~~For the number of square yards (square meters) of Rubblized Pavement, the Contractor will be paid the contract unit price per square yard (square meter). The Contractor will be paid the contract unit price for Rubblized Pavement per square yard (square meter).~~

**Division 23. Surface Courses.****Section 2301****2301.04, C, Entrained Air Content**

**Replace** the entire article:

Air entrainment shall be accomplished by addition of an approved air entraining agent. Air content as determined by Materials I.M. 318, shall be determined on each day of production as early and as frequently as necessary until the air content is consistently acceptable. The intended air content of finished concrete is 6.0% and the target air content shall be determined to account for air loss during consolidation of concrete during slip form paving. The difference between before and after the paver air contents for a given location shall be considered the air loss.

On the first day of paving, the first load shall be tested at the plant. The air content shall be between 8.0% and 12.0%. The next ten loads will be accepted on the basis of this complying air test. Starting with the twelfth load all samples shall be taken at the point of acceptance and the air content before the paver shall be 7.5% plus 1.5% or minus 1.0%. The air loss shall be determined at two locations. The air loss from both locations shall be averaged and added to 6.0% to establish the target air content, rounded to the next higher 0.5%. After the air loss has been established, the air content before the paver shall be the target air content plus 1.5% or minus 1.0%.

After the first day of paving, the air content before the paver shall be the target air content plus 1.5% or minus 1.0%. A new target air content shall be established if the average air loss from two consecutive tests deviates by more than 0.5% from the air loss. The air loss shall be determined at one location per half day. At the option of the Engineer, air loss determination may be reduced if the air loss is consistent.

For projects less than 5000 square yards (4000 m<sup>2</sup>) the air content before the paver shall be 7.5% plus 1.5% or minus 1.0%. At the option of the Contractor, the target air content may be established using the air loss.

The air content for non-slip form paving shall be 7.0% plus 1.5% or minus 1.0%.

**2301.12, Placing Reinforcement**

**Add** as the seventh paragraph:

Cutting the tie wires of the load transfer assemblies shall be the option of the Contractor.

**2301.13, D, 2, b****Delete** entire article:

~~b. Proportioned at a central plant, and only partially mixed in a stationary mixer for transportation and finished mixing in a transit mixer.~~

**2301.13, D, 2, c****Re-letter** the article:

~~c.~~ **b.** Proportioned and then mixed in a transit mixer prior to or during transit.

**2301.16, C, 2, a, Transverse Grooving****Replace** the second paragraph:

On pavement where transverse tining is to be used, a 4 inch to 6 inch (100 mm to 150 mm) wide strip of pavement surface shall not be tined for the length of each transverse joint, providing an untined surface centered over the transverse joint.

**2301.18, End of Run****Replace** entire article:

Whenever 30 minutes or more have elapsed since the last concrete has been deposited on the subgrade or if such a delay is anticipated, an approved header shall be installed.

Header joints shall not be constructed within 5 feet (1.5 m) of an intended or previously placed contraction joint. Header joints shall not be constructed opposite a contraction joint in multiple lane construction.

When a header joint is installed, resumption of paving which abuts the header shall not commence for a minimum of 6 hours.

When the end of the day's run occurs in curb section, sufficient curb shall be omitted to accommodate equipment that must be backed out of the way. Construction of the portion of curb omitted shall be as shown in the contract documents and in accordance with Article 2301.17.

**A. Headers Constructed in Plastic Concrete.**

The header shall be constructed true to line and grade with the face perpendicular to the surface and at right angles to the centerline of the pavement. The tie bar reinforcement shall be level, true to line and grade, and normal to the header joint.

Concrete collected by a finishing machine during its first passage shall not be used adjacent to the header board. Concrete screeded over the header during finishing shall be promptly removed.

Concrete shall be well consolidated against the header and finished with an edging tool.

The header board and all supports shall be removed before paving is resumed.

**B. Headers Constructed in Hardened Concrete.**

The Contractor may pave past the location of the header. After the concrete has hardened, the pavement shall be sawed perpendicular to the centerline of the pavement, creating a vertical face. Holes for the tie bar reinforcement shall be drilled and reinforcement grouted into the holes, in accordance with Article 2301.12. The paving operations may begin adjacent to the header after a minimum of 1 hour after the placement of the reinforcement bars.

**2301.28, Concrete Header Slabs****Replace** the title and entire article:

**2301.28 RESERVED.**

**2301.31, Time for Opening Pavement for Use**

**Replace** "burnish" with "furnish" in the last sentence of the second paragraph.



Replace “with” with “when” in the first sentence of the third paragraph.

Replace “certified plant inspector” and “certified inspector” with “certified technician” in the fifth paragraph.

#### **2301.34, Method of Measurement.**

Delete the first paragraph.

The quantity of the various items of work involved in construction of concrete pavements will be measured by the Engineer in accordance with the following provisions:

#### **2301.34, A, Portland Cement Concrete Pavement.**

Replace the first paragraph.

The method of measurement described herein for Standard or Slip-Form Portland Cement Concrete Pavement The quantity of Standard or Slip-Form Portland Cement Concrete Pavement of the type specified, in square yards (square meters), will be the quantity shown in the contract documents and applies to pavement, concrete pavement widening greater than 6 feet (1.8 m), side street connections, crossovers, ramps, acceleration and deceleration lanes or auxiliary lanes, and concrete paved shoulders having the same design thickness. The coring requirements for thickness do not apply to detour pavements, paved drives, and temporary pavements. The area of pavement constructed of the class specified will be computed in square yards (square meters) from surface measured longitudinally and nominal plan width. Areas of street connections on urban projects will be determined from plan dimensions. Areas of ramps, including acceleration and deceleration lanes, will be determined in square yards (square meters) from plan dimensions, using the edges of the main line pavement as terminals of the ramp pavement. The thickness of pavement constructed will be determined from core depths as follows:

#### **2301.34,D, Incidental Concrete**

Replace the title and entire article:

**D. Intentionally left blank.**

#### **2301.34, E, Concrete Median.**

Replace the entire article.

Unless otherwise provided, the Engineer will compute in square yards (square meters) the area of median constructed from measurements The quantity of Concrete Median, in square yards (square meters), will be the quantity shown in the contract documents. This will be calculated to the nearest 0.1 foot (0.1 m) of the length along the surface and the overall width of median when no integral curb is involved, or the width from back to back of curb when integral curb is involved.

#### **2301.34, J, Saw Cut.**

Replace the title.

**J. Saw Cut and Joint Sealing.**

Add as last paragraph.

Joint sealing will not be measured for payment.

#### **2301.35, Basis of Payment.**

Delete the first paragraph.

For construction of concrete pavement and other construction in connection therewith, the Contractor will be paid the contract unit prices for the following items of work:

#### **2301.35, A, Portland Cement Concrete Pavement.**

Replace the first sentence.

The basis of payment described herein for The Contractor will be paid the contract unit price for Standard or Slip-Form Portland Cement Concrete Pavement of the type specified per square yard (square meter) and

applies to pavement, concrete pavement widening greater than 6 feet (1.8 m), side street connections, ramps, acceleration and deceleration lanes or auxiliary lanes, and concrete paved shoulders having the same design thickness.

Replace “-26-67” with “-26.67” in Row 10, Column 3 of the Payment Schedule Table.

#### **2301.35, D, Incidental Concrete**

Replace the title and entire article:

**D. Intentionally left blank.**

#### **2301.35, E, Concrete Median.**

Replace the entire article.

For the number of square yards (square meters) of median constructed, the Contractor will be paid the contract unit price per square yard (square meter). The Contractor will be paid the contract unit price for Concrete Median per square yard (square meter).

### **Section 2302**

#### **2302.13, Method of Measurement.**

Delete the first paragraph.

The various items involved in construction of PCC pavement widening will be measured as follows:

#### **2302.13, C, Pavement Widening.**

Replace the entire article.

The quantity of PCC pavement widening constructed will be computed in square yards (square meters) by the Engineer from the plan surface width of widening and the measured length of the edge of the old pavement to the nearest 0.1 foot (0.1 meter). The quantity of PCC Pavement Widening, in square yards (square meters), to the nearest 0.1 foot (0.1 meter) along the existing pavement edge, will be the quantity shown in the contract documents.

#### **2302.13, D, Shoulders.**

Replace the first sentence.

The number of stations (meters) of Types A, B, and C shoulder constructed will be measured by the Engineer along each edge of the widened pavement to the nearest foot (0.1 meter). The quantity of Type A, B, and C Shoulders, in stations (meters), to the nearest 0.1 foot (0.1 meter) along each edge of the existing pavement edge, will be the quantity shown in the contract documents.

#### **2302.14, Basis of Payment.**

Delete the first paragraph.

For the quantity of the various items involved in construction of PCC pavement widening, measured as provided above, the Contractor will be paid as follows:

#### **2302.14, C, Pavement Widening.**

Replace the entire article.

For the number of square yards (square meters) of PCC pavement widening constructed, the Contractor will be paid the contract unit price. The Contractor will be paid the contract unit price for PCC Pavement Widening per square yard (square meter) or the adjusted price per square yard (square meter) as provided in Article 2301.35. This payment shall be full compensation for construction of the pavement widening and all other work not paid for under other items.

**2302.14, D, Shoulders.**

**Replace** the first sentence.

~~For the number of stations (meters) of shoulders of Type A, B, and C constructed, the Contractor will be paid the contract unit price per station (meter). The Contractor will be paid the contract unit price for Type A, B, and C Shoulders per station (meter).~~

**Section 2303**

**2303.02, A, Asphalt Binder**

**Replace** “in AASHTO MP1” with “of Section 4137” in the second sentence.

**2303.02, B, 1, Individual Aggregates**

**Replace** the first sentence of the second paragraph:

When frictional classification of the coarse aggregate is required, the contract documents will specify the friction level and location.

**Add** a third sentence and table to the second paragraph:

The aggregate retained on the No. 4 (4.75 mm) sieve shall meet or exceed the following amount for each classification:

FRICTION AGGREGATE CLASSIFICATION			
Friction Level	Type 2	Type 3	Type 4
L-2	25%		80%
L-3		45% <sup>(1)</sup>	80%
L-4			50%

<sup>(1)</sup> A minimum of 30% of Type 2 friction aggregate may be substituted for the Type 3 aggregate.

**2303.02, B, 2, Blended Aggregate**

**Delete** the first paragraph:

~~Combined gradations for mixtures on projects with greater than 10,000,000 design (20 year) ESALs shall be designed outside of the “restricted zone” gradation control. For mixtures on projects between 3,000,000 and 10,000,000 ESALs, the combined gradation may be designed outside the “restricted zone” or may be designed to pass through the “restricted zone” from a larger particle size above the maximum density line to a smaller particle size below the maximum density line. For shoulders placed as a separate operation and all other mixtures, it is the Contractor’s option to design mixes outside the “restricted zone.”~~

**Replace** paragraphs a - d:

- a. It is the Contractor’s option to design mixes outside the “restricted zone”.
- b. Combined gradations for surface and intermediate mixtures on projects with greater than 10,000,000 design (20 year) ESALs shall be designed with an added gradation control point of 28% maximum passing the No. 16 (1.18 mm) sieve for a 3/4 inch (19 mm) mix size and 32% for 1/2 inch (12.5 mm) mixes. For surface and intermediate mixtures on projects between 3,000,000 and 10,000,000 ESALs, the combined gradation shall be designed with an added gradation control point of 24% maximum passing the No. 30 (600 µm) for a 3/4 inch (19 mm) mix size and 25% for 1/2 inch (12.5 mm) mixes.
- c. Aggregate consensus properties are specified in Materials I.M. 510.
- d. When mixtures include RAP, the blended mineral aggregate gradation shall be a mixture of extracted RAP aggregate combined with virgin aggregate.

**2303.02, D, Hot Mix Asphalt Mixture**

**Replace** the reference to “AASHTO PP28-00” with “Materials I.M. 510”.

**Replace** the reference to “AASHTO MP2-00” with “Materials I.M. 510”.

**Delete** the last paragraph:

~~The following criteria will be standard for all projects:~~

~~Designs will be based on an average 7-day maximum air temperature of <39°C~~

~~$V_t$  at  $N_{design}$  — 4.0% for base, intermediate, and surface mixtures;  
3.5% for base mixtures on projects with less than 3,000,000 ESALs  
3.0% for shoulders placed as a separate operation.~~

~~VMA at  $N_{design}$  — Set by Nominal Maximum Size of Aggregate (refer to AASHTO MP2-00)~~

~~VMA at  $N_{design}$  — Set by design ESALs (refer to AASHTO MP2-00)~~

~~See Table 1 for density — gyratory compaction criteria~~

~~Filler/bitumen ratio ( $P_{200}/P_{be}$ ) — 0.6 to 1.4~~

~~Binder film thickness (microns) 8.0 — 15.0~~

~~Where:~~

~~$V_t$  = Target percent air voids~~

~~$G_{mm}$  = Maximum specific gravity of uncompact mixture~~

~~$N_{initial}$  = Initial number of gyrations~~

~~$N_{design}$  = Design number of gyrations~~

~~$N_{max}$  = Maximum number of gyrations~~

~~VMA = Voids in mineral aggregates~~

~~VFA = Voids filled with asphalt~~

~~$P_{200}$  = Percent passing No. 200 (75 $\mu$ m) sieve~~

~~$P_{be}$  = Effective asphalt content~~

**Table 1 - Gyratory Mix Design Criteria**

20 Year ESALs	-Density (expressed as % $G_{mm}$ )		
	@ $N_{initial}$	@ $N_{design}$	@ $N_{max}$
< 300,000	= 91.5		
< 1,000,000	= 90.5		
< 3,000,000	= 89.5	96.0	< 98.0
$\geq$ 3,000,000	= 89.0		

**2303.03, C, Placement**

**Add** as the first sentences of the sixth paragraph:

When placing two adjacent lanes, not more than one normal day’s run shall be made on one side before the adjacent side or pass is completed.

**2303.03, F, Limitations**

**Add** entire new article:

**F. Limitations.**

Headers, when required to end paving for winter shutdown, shall be located adjacent to each other. A winter shutdown runout of 50 feet (15 m) in length per 1 inch (25 mm) of lift thickness shall be installed. The runout shall be removed before commencement of paving and shall be incidental to HMA.

**2303.04, A, Mix Design - Job Mix Formula**

**Replace** “\$500” with “\$1000” in the last sentence of the last paragraph.

**2303.04, B, 1, Sampling and Testing**

**Replace** “Materials I.M. 510” with “Materials I.M. 325G” in the first indented paragraph under the seventh paragraph.

**Replace** “Materials I.M. 510” with “Materials I.M. 501” in the last sentence.

**2303.04, B, 2, Production Control**

**Replace** “Materials I.M. 510” with “Materials I.M. 501” in the first sentence of the eighth paragraph.

**2303.04, C, 3, Smoothness**

**Add** the title and paragraph:

**3. Smoothness.**

Smoothness of the surface course shall be in accordance with Section 2316.

**2303.04, D, 1, Loose Material Requirements**

**Replace** the first sentence of the second paragraph:

Samples of loose HMA mixture shall be taken in accordance with Materials I.M. 322, weigh at least 60 pounds (28 kg), and shall be transported to the test facility in a way to retain heat to facilitate sample splitting procedures.

**Delete** the third paragraph:

~~When requested by the Engineer, normally once per day, an additional 50 pounds (25 kg) box sample will be required for correlation and validation testing.~~

**2303.05, Method of Measurement.**

**Delete** the first paragraph.

~~The Engineer will measure the quantities of the various items of work involved in placement of bituminous mixtures in accordance with the following provisions:~~

**2303.05, A, Hot Mix Asphalt Mixture.**

**Replace** the entire article.

~~The quantity of intermediate or surface mixture used if in lieu of base for outside shoulders, placement will be calculated by template quantity, or when placed as a separate operation, from scale tickets. If the substitute mixture placed on the shoulder is for a intermediate course fillet only, the quantity in the fillet shall be included for payment in the quantity placed in the adjacent intermediate course.~~

**1. Measurement by Weight (Mass).**

When measurement is by weight (mass), the quantity of **Hot Mix Asphalt Mixture** of the type specified will be expressed in tons (megagrams) and determined from the weight (mass) of individual loads, **including fillets**, measured to the nearest 0.01 tons (0.01 Mg). Loads may be weighed in trucks, weigh hoppers, or from the weight (mass) from batch plants computed by count of batches in each truck and batch weight (mass). Article 2001.07 applies. The weights (mass) of various loads shall be segregated into the quantities for each pay item.

**2. Measurement by Area.**

When payment is based on square yards (square meters), **the area of each lot will be computed the quantity of Hot Mix Asphalt Mixture of the type specified, will be the quantity shown in the contract documents to the nearest 0.1 square yard (0.1 m<sup>2</sup>) from surface dimensions measured to the nearest 0.1 foot (30 mm). When the average measured width of the lot is equal to or greater than the plan width, the computed area will be based on the plan width. When the average measured width is less than plan width, the computed area will be based on the measured width.**

When constructing shoulders on a basis of payment of square yards (square meters), inspection of the profile and elevation will be based on the completed work relative to the pavement edge; the Contractor shall be responsible for the profile and elevation of the subgrade and for thickness.

If the Contractor chooses to place intermediate or surface mixture in lieu of base for the outside shoulders, the quantity will be calculated from the pavement and shoulder template, or when placed as a separate operation, from scale tickets. If the substitute mixture placed on the shoulder is for an intermediate course fillet only, the quantity in the fillet shall be included for payment in the quantity placed in the adjacent intermediate course.

#### **2303.05, F, Fabric Reinforcement.**

**Replace** the entire article.

The Engineer will calculate to the nearest 0.1 square yards (0.1 m<sup>2</sup>) on the roadway surface dimensions measured to the nearest 0.1 foot (30 mm) for the fabric reinforcement placed in acceptable condition. The quantity of Fabric Reinforcement, in square yards (square meters), to the nearest 0.1 square yard (0.1 m<sup>2</sup>), will be the quantity shown in the contract documents.

#### **2303.06, A, Hot Mix Asphalt Mixture.**

**Replace** the first sentence.

For the quantity of each class and category of mixture, including fillets, the Contractor will be paid the respective contract unit price. The Contractor will be paid the contract unit price for Hot Mix Asphalt Mixture of the type specified per ton (megagram) or square yard (square meter).

#### **2303.06, D, Fabric Reinforcement.**

**Replace** the first sentence.

For the number of square yards (square meters) of fabric reinforcement installed, the Contractor will be paid the contract unit price. The Contractor will be paid the contract unit price for Fabric Reinforcement per square yard (square meter).

### **Section 2310**

#### **2310, Portland Cement Concrete Overlay**

**Replace** the entire section:

##### **2310.01 DESCRIPTION.**

This work consists of overlaying of an existing pavement with a PCC overlay. The various types of PCC overlay are as follows:

1. Bonded overlay consists of placing a PCC overlay over an existing PCC pavement.
2. Unbonded overlay consists of placing a PCC overlay over an existing pavement where a stress relief layer is placed on top of the existing PCC pavement or an existing PCC pavement that has been overlaid with HMA (composite pavement).
3. Whitetopping consists of placing a PCC overlay over an existing, full depth asphalt pavement.

The requirements of Section 2301 shall apply to this work with the modifications for each type of work identified below.

##### **2310.02 MATERIALS.**

###### **A. Bonded Overlays.**

###### **1. Aggregate.**

Unless otherwise specified, the coarse aggregate shall be the same type of aggregate, crushed limestone, or gravel, as the existing pavement. The coarse aggregate shall have as the largest size particle, no greater than one-third of the overlay thickness.



## 2. Concrete.

For projects with mainline paving less than 50,000 square yards (40,000 m<sup>2</sup>), Gradation No. 5, and a C-3WR mixture, with or without fly ash, shall be used. For larger projects, a QM-C design mixture shall be used, as described below:

### a. Description.

The Contractor shall develop a concrete mixture design with an optimum combined aggregate gradation. Optimization of the aggregates should produce concrete with low water requirement as well as with improved workability and finishing characteristics. While concrete strength is important and shall be measured, it is not the basis for optimization of the concrete mixture design.

The Concrete Design Mixture (CDM) shall apply to mainline slip form pavement. At the Contractor's option, the CDM may apply to any other slip form paving.

### b. Coarse and Fine Aggregate.

The Gradation Table in Article 4109.01 will not apply to coarse or fine aggregate with the following exceptions: fine aggregate sources shall meet the requirements of Gradation No. 1 for the 3/8 inch (9.5 mm) sieve and the No. 4 (4.75 mm) sieve, except for Class 3I gravel sources.

A coarse, uncrushed sand may be produced from an approved Class 2 or Class 3 gravel source meeting the quality requirements of Section 4110 and the following gradation limits:

<u>Sieve</u>	<u>% Passing</u>
1/2 inch (12.5 mm)	100
3/8 inch (9.5 mm)	90-100
No. 4 (4.75 mm)	80-100

### c. Intermediate Aggregate.

Any limestone intermediate aggregate material shall meet the durability class required for the coarse aggregate. Intermediate aggregate shall be considered coarse aggregate for gradations and correlations.

Uncrushed pea gravel produced from an approved Class 2 or Class 3 gravel source and meeting the quality requirements of Section 4110 shall not exceed 10% of the total aggregate.

### d. Laboratory Design Mixture.

The Contractor shall develop a CDM based on a unit volume of 1.000 according to industry standard practice. The CDM shall contain proportions of materials, including admixtures. Proportions shall be based upon saturated surface dry aggregates and shall produce a workable concrete mixture meeting the following constraints:

Nominal Maximum Coarse Aggregate Size	1/3 the pavement design thickness
Gradation	Materials I.M. 532
Cementitious Content	Minimum, 560 lbs./cy* (333 kg/m <sup>3</sup> *)
Fly Ash Substitution Rate	See Article 2301.04 Paragraph E
Water/Cementitious Ratio	Maximum, 0.45
Target Air Content	6% ± 1%
28 Day Flexural Strength, Third Point	Minimum, 640 psi (4.40 MPa)

\*The minimum cement content assumes the use of Type I/II cement with a specific gravity of 3.14 for an absolute volume of 0.106. The absolute volume shall be 0.106 and the weight (mass) of cement shall be determined from the specific gravity of the cement, if other than Type I/II cement. Cement content may need to be increased to maintain water to cementitious ratio during hot weather conditions.

Normal production gradations shall be used to determine the relative percentage of each individual aggregate used in the CDM. The relative percentage of each individual aggregate shall be selected to produce the desired combined aggregate gradation using on the following sieves: 1 inch, 3/4 inch, 1/2 inch, 3/8 inch, No. 4, No. 8, No. 16, No. 30, No. 50, No. 100, and No. 200 (25 mm, 19 mm, 12.5 mm, 9.5 mm, 4.75 mm, 2.36 mm, 1.18 mm, 600 µm, 300 µm, 150 µm, and 75 µm). A target combined gradation shall be developed for each CDM based on normal

production gradations and the relative percentages of each individual aggregate. Percent passing the No. 200 (75 µm) sieve shall not exceed 1.5% for the combined aggregate gradation. Water reducing admixture, Type A, or water reducing and retarding admixture, Type D, may be used in the CDM.

Laboratory development of the CDM shall be in accordance with AASHTO T 126. Mix designs may be conducted in a ready mix or central mix batch plant provided the following conditions are met:

- 1) all non-mix design materials are emptied,
- 2) mix design materials are used, and
- 3) batch size at least 3 cubic yards (2 m<sup>3</sup>).

Personnel overseeing the development of the CDM shall be an Iowa DOT PCC Level III Certified Technician. The Engineer shall be allowed to witness the development of the CDM. Notice shall be given 7 calendar days prior to this event. The following tests shall be performed in the development of the CDM:

Specific Gravity of Each Individual Aggregate	Material I.M. 307
Gradation of Each Individual Aggregate	Material I.M. 302
Unit Weight of Plastic Concrete	AASHTO T 121
Air Content of Plastic Concrete	Material I.M. 318
28 Day Flexural Strength	AASHTO T 97
Temperature of Plastic Concrete	ASTM C 1064

**e. Mix Design Documentation.**

At least 7 calendar days prior to the start of paving the Contractor shall submit a CDM report to the District Materials Engineer for approval. Contract extensions will not be allowed due to inadequate or additional CDMs. The CDM report shall include the following:

Cover Page	Contractor name Project number Date and location of CDM laboratory development Date Submitted Signature of Contractor representative
Material Source Information	Brand Type Source

Material Proportion Information	Specific gravity Relative percentage of each individual aggregate Target combined gradation % passing (Material I.M. 531) Target combined gradation charts (Material I.M. 532) Design batch weight (mass) (SSD) As mixed batch weight (mass) (SSD)
Mix Properties	Unit weight (mass) of plastic concrete Air content of plastic concrete 28 day flexural strength Slump Temperature of plastic concrete

**B. Unbonded Overlays.**

The HMA stress relief course for unbonded overlays shall consist of a nominal 1 inch (25 mm) course of HMA meeting the requirements of Section 2303. Asphalt binder shall be PG 58-28. Mixture shall meet 300,000 ESAL, 3/8 inch (9.5 mm), HMA mix requirements, target air voids is 3.0%, no maximum film thickness restriction, and no minimum filler/bitumen ratio restriction. Aggregate shall be Type B with no percent crushed particle requirements and gradation shall fall below the restricted zone.

**2310.03 CONSTRUCTION.****A. EQUIPMENT.**

Surface preparation equipment used shall be subject to approval of the Engineer and shall comply with the following:

**1. Scarifying or Shotblasting Equipment.**

Equipment shall be a power operated, capable of uniformly scarifying or removing the existing surface to depths required in a satisfactory manner. Other types of removal devices may be used if their operation is suitable and if they can be demonstrated to the satisfaction of the Engineer. The contract documents will include a pay item for such work.

**2. Sand Blasting Equipment.**

Sand blasting equipment shall be capable of removing rust, oil, and concrete laitance from the existing surface of the pavement.

**B. PREPARATION OF SURFACE.**

If full depth base repair is included in the project, it shall be completed prior to surface preparation.

Surface preparation shall include the entire surface to be resurfaced. Materials removed in the preparation operation may be placed in the shoulder area unless otherwise specified in the contract documents.

The Contractor shall clean the existing surface of all loose or adhering foreign material prior to placement of the PCC overlay.

**1. Bonded Overlays.**

The surface shall be prepared by shot blasting, or shall be scarified and followed by shot blasting. Scarification shall be to a nominal depth of 1/4 inch (5 mm). In either case, the preparation shall be of an extent to remove all dirt, oil, and other foreign materials, as well as any laitance or loose material from the surface and edges against which new concrete is to be placed.

**2. Unbonded Overlays.**

When jointing is specified in which panels are smaller than a normal lane width, the entire surface shall be scarified to create a roughened surface. This will not apply when a new HMA stress relief layer is constructed as a part of this contract.

Any high spots found in the existing HMA pavement shall be trimmed at the direction of the Engineer. This work would be accomplished during the scarification operation, only at isolated locations, and would be considered incidental to the surface preparation.

**3. Whitetopping.**

When jointing is specified in which panels are smaller than a normal lane width, the entire surface shall be scarified using a cold-milling operation to create a roughened surface.

Any high spots found in the existing HMA pavement shall be trimmed at the direction of the Engineer. This work would be accomplished during the scarification operation, only at isolated locations, and would be considered incidental to the surface preparation.

**C. PLACING AND FINISHING OVERLAY.**

The Contractor shall construct the pavement in a manner that will provide a smooth riding surface. Section 2316 shall apply to smoothness of the completed overlay for Primary projects and when specifically required for Secondary projects.

The placing equipment shall be controlled to the proper elevation by string line. Cross sections shall be taken and a grade line established. The Engineer will review and approve the new grade lines. Information detailing the pavement design thicknesses at the various survey points and material quantities will also be provided. During construction, these grades shall not be altered solely to account for concrete overruns. Some overrun is normal and only with approval of the Engineer will they be adjusted.

## 1. Bonded Overlays.

### a. Surface Cleaning.

Prior to placing concrete onto the surface, the entire surface shall be cleaned with an air blast. After cleaning, no traffic will be permitted on the cleaned surface except that necessary for overlay construction.

### b. Surface Condition.

The prepared surface shall be dry to allow some absorption of the concrete mortar.

### c. Joints.

The exact location of each contraction and expansion joint in the existing pavement and the joint to be sawed at each full depth patch shall be identified on both sides by a reliable method.

Joints shall be sawed in the resurfacing directly over existing transverse joints. Transverse joints shall be sawed to the full depth of new resurfacing concrete, including depressions created in the existing surface, and as specified in the widening areas. Transverse joints shall be sawed as soon as possible without causing excessive raveling. Joints shall not be sawed over existing longitudinal joints.

## 2. Unbonded Overlays.

### a. Hot Mix Asphalt Stress Relief Course.

Compaction shall be in accordance with Article 2303.03, D, Class 1C Compaction except only static steel wheeled rollers shall be used.

### b. Surface Cleaning.

The Contractor shall clean the existing surface of all loose or adhering foreign material prior to placement of the PCC over HMA pavement. Normally this will be accomplished with a power broom and shall be available during paving operations to clean loose material that may be tracked onto the surface by the construction equipment.

### c. Surface Condition.

The prepared surface shall be dry when concrete is placed on the surface of the HMA pavement to allow some absorption of the concrete mortar. If the surface of the HMA is above 110°F (40°C), the Contractor may apply water to the surface of the HMA ahead of the paving operation in order to cool the surface. The water shall be applied far enough in advance of the paving operation that the surface will dry from evaporation before concrete is placed. No water shall be applied to the surface of the pavement when the HMA surface temperature is below 100°F (38°C).

### d. Joints.

When jointing is specified in which panels are smaller than a normal lane width, the joints shall be 1/8 inch (3 mm) wide with no cleaning or sealing required.

## 3. Whitetopping.

### a. Surface Cleaning.

The Contractor shall clean the existing surface of all loose or adhering foreign material prior to placement of the PCC over HMA pavement. Normally this will be accomplished with a power broom and shall be available during paving operations to clean loose material that may be tracked onto the surface by the construction equipment.

### b. Surface Condition.

The prepared surface shall be dry when concrete is placed on the surface of the HMA pavement to allow some absorption of the concrete mortar. If the surface of the HMA is above 110°F (40°C), the Contractor may apply water to the surface of the HMA ahead of the paving operation in order to cool the surface. The water shall be applied far enough in advance of the paving operation that the surface will dry from evaporation before concrete is placed. No water shall be

applied to the surface of the pavement when the HMA surface temperature is below 100°F (38°C).

**c. Joints.**

When jointing is specified in which panels are smaller than a normal lane width, the joints shall be 1/8 inch (3 mm) wide with no cleaning or sealing required.

**D. LIMITATION OF OPERATIONS.**

At temperatures below 55°F (13°C) the opening time shall be determined using the maturity method. Resurfacing concrete shall not be placed when the air or pavement temperature is below 40°F (4°C).

The Contractor will be permitted to use the shoulders for construction activities. It will be the Contractor's responsibility to repair the shoulders at no additional cost as deemed necessary by the Engineer, to restore the shoulders to a condition acceptable for shoulder work. The Contractor may elect to limit the use and vehicle loadings to minimize this work and its cost.

Bonded concrete overlays shall be placed between June 1 and September 30.

Unbonded overlay and whitetopping materials shall not be placed on any HMA when the pavement surface temperature exceeds 120° F (50°C).

**2310.04 METHOD OF MEASUREMENT.**

The quantity of the various items of work involved in the construction of PCC overlay will be measured by the Engineer in accordance with the following provisions:

**A. Portland Cement Concrete Overlay, Furnish Only.**

The quantity of resurfacing concrete furnished will be measured in cubic yards (cubic meters), using a count of batches incorporated. This quantity will include concrete placed in widening sections and partial depth patches.

**B. Portland Cement Concrete Overlay, Placement Only.**

The quantity of Portland Cement Concrete Overlay, Placement Only, in square yards (square meters), will be the quantity shown in the contract documents. The area of PCC overlay placement will be determined from the longitudinal surface and the nominal pavement width, including widening sections.

**C. Surface Preparation.**

The quantity of Surface Preparation, in square yards (square meters), will be the quantity shown in the contract documents. The area of surface preparation will be determined from the longitudinal surface and the nominal width of existing pavement.

**D. Hot Mix Asphalt Stress Relief Course.**

The asphalt binder will be measured in accordance with Article 2303.05, B.

**1. Measurement by Weight (Mass).**

From all plants, the quantity of mixture measured for payment will be computed from the weights (mass) of individual loads. Loads may be weighed in trucks or in weigh hoppers, or the weights (mass) from batch plants charging trucks by batch may be computed by count of batches in each truck and batch amount. Article 2001.07 shall apply.

**2. Measurement by Area.**

The quantity of Hot Mix Asphalt Stress Relief Layer, in square yards (square meters), will be the quantity shown in the contract documents. The area of surface preparation will be determined from the longitudinal surface and the nominal width of existing pavement.

**2310.05 BASIS OF PAYMENT.**

For the performance of acceptable work, measured as provided above, the Contractor will be paid the contract unit price in accordance with the following provisions:

**A. Portland Cement Concrete, Furnish Only.**

The Contractor will be paid the contract unit price per cubic yards (cubic meters) for Portland Cement Concrete, Furnish Only, as measured above. This payment shall be full compensation for furnishing all raw materials, and for proportioning, mixing, and delivery of concrete to the paving machine.

**B. Portland Cement Concrete Overlay, Placement Only.**

The Contractor will be paid the contract unit price per square yard (square meter) for Portland Cement Concrete Overlay, Placement Only. This payment shall be full compensation for furnishing all materials, labor, and equipment necessary to place, finish, texture, and cure the concrete, including the placement of tie bars for widening, if required, and sawing, cleaning, and sealing the joints, if required.

**C. Surface Preparation.**

The Contractor will be paid the contract unit price per square yard (square meter) for Surface Preparation. This payment shall be full compensation for preparation of the existing pavement, sandblasting or shot blasting, and for removal of the existing pavement surface material in accordance with Article 1104.08.

**D. Hot Mix Asphalt Stress Relief Course.**

The Contractor will be paid for the asphalt binder in accordance with Article 2303.06, B.

**1. Measurement by Weight (Mass).**

The Contractor will be paid the contract unit price per ton (megagram) for Hot Mix Asphalt Stress Relief Course as measured above. This payment shall be full compensation for furnishing and placing the HMA stress relief course.

**2. Measurement by Area.**

The Contractor will be paid the contract unit price per square yard (square meter) for Hot Mix Asphalt Stress Relief Course constructed. This payment shall be full compensation for furnishing and placing the HMA stress relief course, including the cost of the asphalt binder.

**Section 2316****2316.01, B, Exclusions**

**Replace** the first paragraph:

Areas excluded from smoothness testing are crossovers, shoulders, and sections less than 50 feet (15 m) long.

**2316.02, Measurement**

**Replace** the first paragraph:

The Contractor shall provide and operate a California type profilograph to determine the pavement profile in accordance with Materials I.M. 341. Other types of profilographs or profilers that produce compatible results and meet the requirements of Materials I.M. 341 may be used.

**Replace** the second sentence of the fourth paragraph:

The profilogram shall include the 15 feet (5 m) at the ends of the section.

**2316.02, B, Bridge Approach Sections**

**Replace** the entire article:

Bridge approach sections shall be tested with the profilograph. Each lane of each approach will be an individual segment and will not be considered a part of a pavement segment, section, or project. Testing will be at the center of each traffic lane of travel.

**2316.04, A, Pavement**

**Replace** the first paragraph:

A profile index shall be calculated for each segment from the profilogram in accordance with Materials I.M. 341 except for:

1. Side road connections less than 600 feet (180 m) in length.
2. Single lift pavement overlays 2 inches (50 mm) or less in thickness unless the existing surface has been corrected by milling or scarification.
3. Storage lanes, turn lanes, and pavement less than 8.5 feet (2.6 m) in width.
4. The 15 feet (5 m) at the ends of the section when the Contractor is not responsible for the adjoining surface.

**Replace** the first sentence of the third paragraph:

Bumps and dips shall be separately identified on all profilograms.

#### **2316.04, B, Bridge Approach Sections**

**Replace** the entire article:

A profile index shall be calculated for each bridge approach section in accordance with Materials I.M. 341 except for plan lengths less than 50 feet (15 m) which will be checked for bumps and dips only.

#### **2316.06, A, Bumps**

**Replace** the second sentence of the second paragraph:

For all bumps under Schedule B not corrected, the Contractor will be assessed a penalty for each bump over 0.5 inch (13 mm) except when located within 15 feet (5 m) of the end of the section or taper where the Contractor is not responsible for the adjoining pavement.

#### **2316.06, B, Dips**

**Replace** the second sentence of the first paragraph:

The Contractor will be assessed a penalty for dips of 0.5 inch (13 mm) to 1.0 inch (25 mm) that are not corrected except when located within 15 feet (5 m) of the end of the section or taper where the Contractor is not responsible for the adjoining pavement.

#### **2316.07, C, Pavement Adjacent to Existing Pavement**

**Replace** the third paragraph:

Areas not included in the profilograph shall be checked longitudinally with a 10 feet (3 m) straight edge and the surface shall not deviate from a straight line by more than 1/8 inch in 10 feet (3 mm in 3 m). If correction is necessary, it shall meet requirements of Article 2316.05.

### **Section 2317**

#### **2317.01, A, Exclusions**

**Replace** the unnumbered paragraph:

All excluded areas will be checked for 1/2 inch (13 mm) bumps on the bridge, and for 1/2 inch (13mm) bumps and dips on the approach pavement, respectively.

#### **2317.04, Profile Index**

**Add** a fourth sentence:

These areas will be checked for 1/2 inch (13 mm) bumps on the bridge, and for 1/2 inch (13 mm) bumps and dips on the approach pavement, respectively.

#### **2317.06, Smoothness**

**Replace** the first paragraph:

Correction will be required for bumps exceeding 1/2 inch (13 mm) identified on the profilogram and for smoothness, if necessary. Correction will also be required, in lengths excluded from the profilograph index analysis areas. On all bridge decks, new bridge approaches, bridge deck overlays, and overlays of approaches, which are not excluded, a price adjustment of \$900 shall be assessed for each dip of 0.5 inch (13 mm) or greater in each traffic lane. Correction of dips 0.5 inch (13 mm) or greater will not be permitted unless approved by the Engineer and will be included in the evaluation for the segment smoothness. Bumps



exceeding 1/2 inch (13 mm) shall be corrected to less than 3/10 inch (8 mm) on the bridge; and bumps and dips exceeding 1/2 inch (13 mm) shall be corrected to less than 3/10 inch (8 mm) on approach pavements.

**Delete** the third paragraph:

~~If the original surface does not meet this criteria, the surface shall be corrected to the values shown above.~~

### Section 2318

#### 2318.04, A, Preparation

**Replace** the title:

**A. Surface Preparation.**

**Delete** the last sentence:

~~Removal of this vegetation and debris shall be in accordance to Article 1104.08.~~

#### 2318.05, Limitation of Operations

**Add** as new second paragraph:

When resurfacing is part of the contract, all cold-in-place recycled surfaces shall be covered with at least one full lift of HMA prior to winter shutdown.

#### 2318.07, A, Basis of Payment

**Replace** the last sentence:

This payment shall be full compensation for all labor, material (including mixing water), and equipment necessary for surface preparation, milling, mixing, spreading, placing, shaping, and compaction of the completed In-Place Recycled Asphalt Pavement.

### Section 2319

#### 2319.01, Description

**Replace** the second, third, and fourth paragraphs:

Slurry leveling work involves filling shallow depressions in the pavement at and adjacent to cracks with fine slurry mixtures. Application may be by hand lutes.

Slurry wedge work involves placing a fine or coarse slurry mixture in a narrow wedge-shaped strip to correct the differential elevation between the pavement edge and the shoulder as designated in the contract documents.

Strip slurry treatment work consists of longitudinal applications of fine or coarse slurry mixtures as designated in the contract documents. A spreader box shall be required to place the slurry mixture to pavement centerline, widening unit, pavement edge, wheel paths, and lanes, or at other locations and widths as designated by the contract documents or as directed by the Engineer.

#### 2319.02, B, 3, Gradations

**Replace** entire article:

##### **3. Gradation.**

The composite aggregate, excluding mineral filler, shall comply with the following gradation limits for the specified slurry mixture required:

##### **a. Fine Slurry Mixture.**

The aggregate shall meet the requirements for Gradation No. 22 of the Aggregate Gradation Table in Section 4109.

##### **b. Coarse Slurry Mixture.**

The aggregate shall meet the requirements for Gradation No. 23 of the Aggregate Gradation Table in Section 4109.

**2319.09, A, General**

**Add** as new second paragraph:

All applications of Strip Slurry Treatment shall be applied parallel to the center line, edge line, or other reference, using a guide extending at least 3 feet (1 m) ahead of the application equipment.

**2319.10, B, 1, Aggregate for Slurry Wedge**

**Replace** the first sentence:

The quantity of Slurry Wedge Aggregate, of the type specified, in tons (megagrams), measured to the nearest 0.1 ton (0.1 Mg), will be the quantity by weight (mass) of individual loads of aggregate used in accepted portions of the work.

**2319.10, C, 1, Aggregate for Strip Slurry Treatment**

**Replace** the first sentence:

The quantity of Strip Slurry Treatment Aggregate, of the type specified, in tons (megagrams), measured to the nearest 0.1 ton (0.1 Mg), will be the quantity by weight (mass) of individual loads of aggregate used in accepted portions of the work.

**2319.11, B, 1, Aggregate for Slurry Wedge**

**Replace** the first sentence:

The Contractor will be paid the contract unit price for Slurry Wedge Aggregate, of the type specified, per ton (megagrams) of aggregate used measured as provided above.

**2319.11, C, 1, Aggregate for Strip Slurry Treatment**

**Replace** the first sentence:

The Contractor will be paid the contract unit price for Strip Slurry Treatment Aggregate, of the type specified, per ton (megagrams) of aggregate used measured as provided above.

**Division 24. Structures.****Section 2403****2403.01, A, Class D Concrete**

**Replace** the entire article:

Bridge barrier rails shall be Class BR or Class D concrete.

**2403.01, C, Class C Concrete**

**Replace** the entire article:

Refer to Article 2412.02 for concrete used for one course bridge floors and the first course of two course bridge floors. All other structural concrete, including concrete for bridge curbs, bridge medians, and bridge sidewalks, shall also be Class C concrete.

**2403.03, C, Other Admixtures**

**Add** second and third paragraphs:

Approved retarding admixture complying with Section 4103 may be required by the contract documents or by the Engineer. The retarding admixture shall be used in amounts recommended by the manufacturer for conditions which prevail on the project and as approved by the Engineer. When used, it shall be introduced into the mixer after all other ingredients are in the mixer. Other procedures may be approved by the Engineer.

All retarding admixtures used shall be compatible with the air entraining agent used. Previous experience, satisfactory to the Engineer, will be required to indicate the approximate adjustments in proportions made necessary by the addition of the admixture and compatibility with other materials to be used. The retarding admixture shall be agitated prior to and during its use.

**Delete** "in proportions made" in the second sentence of the third paragraph.

#### **2403.11 Placing and Protection in Cold Weather**

**Replace** the first indented paragraph:

The concrete shall be maintained at a temperature of not less than 50°F (10°C) for the first 48 hours after placing. The temperature of the concrete shall then be gradually reduced at a rate not exceeding 25°F (15°C) in 24 hours.

#### **2403.18, A, Forms Which May be Removed in Less than 5 Calendar Days**

**Add** as the second sentence:

Forms for concrete open railing shall not be removed in less than 24 hours after concrete placement.

**Add** as the last sentence:

When Maturity Method, in accordance with I.M. 383, for strength determination is used the above stated flexural strengths will be required, but the days of age will be dependent on the Maturity Curve for the concrete mix used.

#### **2403.18, B, Forms Which Must Remain in Place 5 Calendar Days or Longer**

**Add** as the second sentence:

When Maturity Method, in accordance with I.M. 383, for strength determination is used the flexural strength of 550 psi (3.8 MPa) will be required, but the days of age will be dependent on the Maturity Curve for the concrete mix used.

#### **2403.19, B, Loads Producing Flexural Stresses**

**Add** following the third paragraph:

Unless otherwise specified in the contract documents, at the Contractor's option, the time for subjecting to loads may be determined through the use of the maturity method as described in Materials I.M. 383. When the maturity method is used, the time for loading will be based on strength requirements only, as specified above. The Contractor shall furnish all labor, equipment, and materials necessary for the development of the maturity-strength relationship as described in Materials I.M. 383.

Determining that sufficient strength has been achieved for loading a part of a structure shall remain the responsibility of the Engineer when the maturity method is used. The Contractor's maturity testing may be used as the basis for this determination. The Contractor shall provide sufficient documentation of maturity testing before a part of a structure may be loaded or opened to traffic.

The following shall apply when the maturity method is used:

1. Should circumstances arise which are beyond the Contractor's or Engineer's control and strength cannot be determined by maturity method, the minimum age, minimum flexural strength, and fly ash restrictions shall apply. Flexural strength specimens shall be cured under conditions similar to those of the concrete in the structure.
2. Any changes of a material source or proportion in the concrete mixture shall require a new maturity curve.

Personnel performing maturity testing shall be Level I PCC certified technicians, with training for maturity testing. This certified technician may supervise other persons who may then perform the temperature testing of the constructed structure.

#### **2403.23, Basis of Payment**

**Replace** the seventh paragraph:

When an admixture is required to be added by the contract documents or by the Engineer for the purpose of retarding the set, the cost of the retarding admixture shall be considered incidental to the contract unit price

per cubic yard (cubic meter) of structural concrete.

#### **Section 2404**

##### **2404.06, Placing and Fastening.**

**Add** as the fourth sentence of the first paragraph:

Welding of reinforcing steel will not be permitted unless specified in the contract documents or approved by the Engineer.

#### **Section 2405**

##### **2405.09, Setting Anchor Bolts for Bridge Bearings**

**Replace** the title and first paragraph:

###### **Anchor Bolts for Bridge Bearing**

Unless otherwise specified in the contract documents, anchor bolts to be embedded in the concrete substructures shall be set in drilled holes. Anchor bolts shall be set prior to the time the concrete is placed, when specified in the contract documents. Anchor bolts shall meet the requirements of ASTM F 1554, Grade 36, and be full-length galvanized. Anchor bolts shall be the Unified Coarse Thread Series and have Class 2A tolerance. The end of each anchor bolt intended to project from the concrete shall be color coded in blue to identify the grade. Washers shall be galvanized and shall meet the requirements of ASTM F 436. Nuts shall meet the requirements of ASTM A 563, DH, be heavy hex, and be galvanized. Nuts may be over-tapped in accordance with the allowance requirements of ASTM A 563. Galvanizing shall meet the requirements of ASTM A 153, Class C; or ASTM B 695, Class 50.

#### **Section 2407**

##### **2407.02, A, Aggregates**

**Add** a second paragraph:

The coarse aggregate shall be either durability class 3 or 3i as described in Article 4115.04.

##### **2407.02, H, Cement**

**Add** as the first sentence:

Section 4101 shall apply.

##### **2407.02, I, Fly Ash**

**Replace** the entire article:

###### **I. Mineral Admixtures.**

Section 4108 shall apply.

Fly ash may be substituted for Portland cement. The substitution rate shall not be more than 15% by weight (mass).

GGBFS may be substituted for Portland cement. The substitution rate for GGBFS as a mineral admixture shall not exceed 35% by weight (mass).

##### **2407.03, Concrete**

**Replace** the first sentence of the second paragraph:

If the units are to form curbs or floors of structures, air entrainment shall be required and be accomplished by addition of an approved air-entraining admixture.

**2407.04, C, Stressing Equipment**

**Replace** the entire article:

Equipment used to tension tendons shall be of a type such that the prestressing force may be accurately known. Load cells, dynamometers, and hydraulic gages of hydraulic pump and jacking systems shall be capable of measuring the force applied to the tendons within 2% of the actual force. This equipment shall be calibrated at least once every 12 months or anytime the tensioning system indicates erratic results. Hydraulic gages, pumps, hoses, and connections shall be calibrated as a system.

All tensioning equipment calibrations shall be performed using load cells calibrated by a testing laboratory or calibration service. Equipment used for calibration purposes shall have current calibration references. The Engineer shall be allowed opportunity to witness calibration of equipment during the Engineer's normal working hours or at a mutually agreeable time.

**2407.08, Post Tensioned Prestressed Concrete**

**Replace** the numbering:

**2407.0811, Post Tensioned Prestressed Concrete.**

**2407.06, Prestressing Steel Stresses and 2407.07, Pretensioned Prestressed Concrete**

**Replace** all of both articles:

**Article 2407.06 Prestressing Steel Stresses.**

The number, size, and position of individual tendons (7-wire strand) and the prestressing force shall be as shown in the contract documents.

If anchored at other than 70°F (20°C), the initial prestressing force shall be adjusted as follows:

<u>Temperature of Tendons</u>	<u>Initial Prestressing Force</u>
70°F (20°C)	As shown in the contract documents
Below 70°F (20°C)	Increase 1.0% per 10°F (5°C)
Above 70°F (20°C)	Decrease 1.0% per 10°F (5°C)

After the tendons have been positioned, an initial force between 1,000 and 4,500 pounds (4.5 kN and 20 kN) shall be applied to each tendon. The initial force shall be measured within a tolerance of  $\pm 100$  pounds (0.5 kN) for initial forces under 3,000 pounds (13 kN) and a tolerance of  $\pm 200$  pounds (1 kN) for initial forces of 3,000 pounds (13 kN) or more.

The theoretical elongation of the tendons is calculated from material properties furnished by the manufacturer and allowable losses. Allowable losses may include seating losses, bed shortening, abutment movement, and temperature adjustments.

The pretensioning shall be measured by the net elongation of the tendons. The calculated theoretical net elongation shall be considered the target. A tolerance of  $\pm 1/2$  inch (13 mm) from the calculated net elongation, after seating, may be allowed.

The tensioning procedure shall be conducted so the indicated stress, measured by the tensioning system, is within 5% of the calculated stress, based upon the corresponding elongation. The distribution of the stress shall be within 5% of the calculated stress at all points along the tendon or when measured at the end of the bed.

Temporary overstressing of the tendons is allowed, but shall at no time exceed 80% of the specified tensile strength of the tendons. Tendons shall not be seated in this overstress condition.

Tendons shall be tensioned between fixed end anchorages by means of jacks either separately or in a group. Several units may be cast in one continuous line in which case they shall be tensioned simultaneously.

Deflected tendons may be tensioned in place. Alternatively, deflected tendons may be partially tensioned and then raised to the predetermined final position at the beam ends, achieving the required prestressing force.

Tendons may be raised simultaneously to the predetermined final position or at any one point, in a single lift, provided the sequence of lifting commences at the point nearest the center of the bed and then progresses alternately at points equidistant from the center to the ends.

Tendons shall be supported at each deflection point on a freely rotating metal pulley not less than 3/4 inch (19 mm) in diameter.

The number of broken strand wires shall not exceed 2% of the total number of strand wires nor one broken wire of any one strand.

#### **2407.08 PRESTRESS TRANSFER.**

When accelerated heat curing is used, prestress transfer shall be performed immediately after the curing period is completed and while the concrete is warm and moist.

Deflected tendons, if any, are to be released first, either by lowering holdup devices at beam ends as nearly simultaneously as practical, or if this is not feasible, deflected tendons shall be flame cut in each beam interval in rotation until all deflected tendons are released. The procedure for flame cutting deflected tendons shall be subject to approval by the Engineer.

The hold down devices shall then be released from the bed and the straight line tendons released simultaneously and gradually with the jack. If this is not feasible, heating of the individual tendons shall be employed as follows:

Heating of each individual tendon shall be done simultaneously on the tendon at a minimum of two locations along the casting bed. Heating shall be done along the tendon over a minimum 5 inch (125 mm) distance. The application of heat shall be controlled so that failure of the first wire in the tendon does not occur for at least five seconds after heat is applied, followed by a gradual elongation and failure of the remaining wires. The tendon shall also be heated until failure occurs at each beam interval before proceeding to the next tendon. The sequence of prestress transfer between individual tendons shall be such that there is minimum eccentricity of prestress load. Alternate procedures for releasing deflected or straight-line tendons may be submitted for the Engineer's approval.

The camber due to prestress shall be measured while the beam is on the bed by checking the beam profile within three hours after prestress transfer.

#### **2407.09, Proportioning, Mixing, and Placing Concrete**

**Change** the article number 2407.0907

#### **2407.0907, Proportioning, Mixing, and Placing Concrete**

**Replace** in the first sentence of the second paragraph of the new Article 2407.07:

Concrete shall not be placed when the ambient temperature is below 35°F (2°C) unless the plant has been approved by the Engineer for cold weather concrete placement.

**Delete** the last sentence of the third paragraph of the new Article 2407.07:

~~All surfaces which will be exposed in the finished structure shall be finished as provided in Article 2403.21, Paragraph B.~~

#### **2407.10, Curing**

**Change** the article number 2407.1009

#### **2407.1009, Curing**

**Replace** "artificial" with "accelerated" the first sentence of the third paragraph of 2407.1009, Curing.

**Replace** the first sentence of the fourth paragraph of 2407.09, Curing:

In all cases, the concrete shall be covered and remain covered until curing is completed.

**2407.11, Removal of Forms**

**Change** the article number 2407.10

**2407.12, B, Precast Prestressed Units**

**Replace** the 7<sup>th</sup> item:

Sweep (deviations from straight line parallel to center line of member): L/80 (L in feet, sweep is in inches (L in meters, sweep is in millimeters))

**Add** as the 14th item in the list:

Deviation from net theoretical elongation after final seating:  $\pm 1/2$  inch (13 mm)

**Replace** the 25th item in the list:

Elongation (standard gauge length to be a minimum of 20 feet (6 m)):

**2407.14, Finish**

**Replace** the entire article:

All surfaces, which will be exposed in the finished structure, shall be finished as provided in Article 2403.21, B, and be free of honeycomb or surface defects. Structural Repair procedures shall be submitted to the Engineer for approval.

The outer surface of exterior beams shall be finished as follows:

As soon as practicable after removal of the forms, all fins and other surface projections shall be removed, and a prepared grout shall be brushed or sprayed onto the prewetted surface.

The grout shall consist of one part of silica sand and one part of Portland cement blended with acrylic bonding agent and water to produce a consistency sufficient to fill the cavities. The Engineer may require white Portland cement to be used in amounts necessary to obtain a uniform finish.

Immediately after application of the grout, the surface shall receive a float finish with a cork or other suitable float. This operation shall completely fill all holes and depressions on the surface. When the grout is of such plasticity that it will not be pulled from holes or depressions, a float of sponge rubber shall be used to remove excess grout. When the surface is thoroughly dry, it shall be rubbed vigorously with dry burlap to completely remove excess dried grout. The surface finish shall be cured in a manner satisfactory to the Engineer, and heat curing may be required in cold weather. When finished, the surface shall be free from stain and have a uniform color.

Tendon projections shall be cut and bent as detailed in the contract documents. Where the tendon end will be exposed in the completed structure, it shall be cut off reasonably flush with the concrete. The end of each cut off tendon shall be cleaned to a bright appearance.

Beam ends exposed in the completed structure shall be coated and sealed with an approved gray or clear epoxy listed in Materials I.M. 491.12, Appendix A. The epoxy coating and sealing of beam ends shall be as indicated on the plans and shall be applied at the fabricating plant.

**Section 2408****2408.01 Description**

**Replace** the second sentence:

Unless modified elsewhere in the contract documents, all fabrication to which this section applies shall be done in the states, territories, and possessions of the United States and in other locations within the geographic limits of North America and only in steel fabrication shops and plants that are approved as per Materials I.M. 557 prior to the letting.



**2408.09, Bars and Plates**

**Delete** “to hold paint” from the second sentence of the second paragraph.

**2408.13, Section 1, 1.3, Welding Processes**

**Add** as new paragraph 1.3.1.2

**1.3.1.2** The WPS shall be initialed by the welder and posted at the welder's workstation at all times during welding operations.

**2408.13, Section 5, Part B, 5.21**

**Delete** the last sentence of Paragraph 5.21.2:

~~The WPS shall be posted at the welder's work station at all times during welding operations.~~

**2408.13, Section 5, Part B, 5.21.4**

**Replace** the first sentence:

Shop welder's, welding operator's, or tack welders qualification herein specified shall be considered as remaining in effect from the end of the month in which the tests were taken, for a period of 1 year.

**Delete** the third sentence:

~~In all cases, requalification will be required every 5 years.~~

**2408.14, Annealing Normalizing, and Stress Relieving**

**Replace** the title:

Stress Relief Heat Treatment

**Replace** the first paragraph:

Structural members which are in the contract documents to be stress relieved, shall have finished machining, boring, and straightening done subsequent to heat treatment. Stress relief heat treatment shall be done in accordance with AWS D1.5 Section 4.4.

**Replace** the last paragraph:

All members, such as bridge shoes, pedestals, rockers, or other parts, which are built up by welding sections of plate together, shall be stress relieved, unless otherwise stated in the contract documents.

**2408.16, Camber of Rolled Beam and Plate Girder Spans**

**Delete** the 8th paragraph:

~~Camber of main members of continuous or simple span bridges with lines composed of rolled beams, beams and girders, or girders, shall be fabricated so that when the members are assembled in laydown with bearing points accurately positioned as shown on the erection diagram, points on any member shall not vary in the offset position from that indicated in the erection diagram by more than  $\pm 1/2$  inch (13 mm).~~

**Delete** the last paragraph:

~~The erection diagram on the shop drawings shall show camber offsets at bearing points and splice points, and at midpoints of individually cambered beams or girders.~~

**2408.17, Bolt Holes**

**Replace** the last sentence of the first paragraph:

Holes in other than a main stress carrying member in metal not thicker than 3/4 inch (19 mm) for carbon steel and 5/8 inch (16 mm) for alloy steel shall be punched or drilled full size.

**Add** a second and third paragraph:

When reaming is required all holes shall be subpunched or subdrilled. Subdrilling will be required if thickness limitations govern. The subpunching or subdrilling shall be 3/16 inch (5 mm) smaller and, after assembling,

reamed 1/16 inch (2 mm) larger or drilled full size to 1/16 (2 mm) larger than the nominal diameter of the bolts.

All steel templates shall have hardened steel bushings in holes accurately dimensioned from the centerline of the connections as inscribed on the template. The centerline shall be used in accurately locating the template from the milled or scribed ends of the members.

#### **2408.17, A, Punched Holes**

**Replace** the entire article:

The diameter of the die shall not exceed the diameter of the punch by more than 1/16 inch (2 mm). If any holes must be enlarged to admit the bolts, such holes shall be reamed. Holes must be clean cut without torn or ragged edges. The slightly conical hole that naturally results from punching operations is considered acceptable with the approval of the Engineer.

#### **2408.17, B, Subpunched and Reamed Holes Reamed or Drilled Holes**

**Replace** the **title and** entire article:

##### **B. Reamed or Drilled Holes**

Reamed or drilled holes shall be cylindrical and perpendicular to the member. Where practical, reamers shall be directed by mechanical means. Reaming and drilling shall be done with twist drills, twist reamers or rotobroach cutters. Connecting parts requiring reamed or drilled holes shall be assembled and securely held while being reamed or drilled and shall be match marked before disassembling.

#### **2408.17, C, Drilled Holes**

**Replace** the title and the entire article:

##### **C. Accuracy of Holes.**

Holes not more than 1/32 inch (1 mm) larger in diameter than the true decimal equivalent of the nominal diameter that may result from a drill or reamer of the nominal diameter are considered acceptable. The width of slotted holes, which are produced by flame cutting or a combination of drilling or punching and flame cutting, shall generally be not more than 1/32 inch (1 mm) greater than the nominal width. The flame cut surface shall be ground smooth.

#### **2408.17, D and E**

**Re-letter** article 2408.17, D-F and 2408 17, E-G.

#### **2408.17, D, Accuracy Before Reaming**

**Add** new title and article:

##### **D. Accuracy Before Reaming.**

All holes subpunched or subdrilled shall be so accurate that after assembling (before any reaming is done) a cylindrical pin 1/8 inch (3 mm) smaller in diameter than the nominal size of the hole may be entered perpendicular to the face of the member, without drifting, in at least 75% of the contiguous holes in the same plane. If the requirement is not fulfilled, the badly subpunched/subdrilled pieces will be rejected. If any hole does not allow a pin 3/16 inch (5 mm) smaller in diameter than the nominal size of the subpunched/subdrilled hole to pass, it will be cause for rejection.

#### **2408.17, E, Accuracy After Reaming**

**Add** new title and article:

##### **E. Accuracy After Reaming or Drilling.**

When holes are reamed or drilled, 85% of the holes in any contiguous group shall, after reaming or drilling, show no offset greater than 1/32 inch (1 mm) between adjacent thicknesses of metal.

**2408.19, Shop Assembly**

**Replace** the first sentence of the last paragraph:

Members to be welded shall be brought into correct alignment and held in position by bolts, clamps, wedges, guylines, struts, tack welds, or other suitable devices, until welding has been completed.

**2408.30, A, Surface Preparation**

**Replace** the first and second sentences of the first paragraph:

All steel surfaces to be painted shall be given a near white metal blast cleaning in accordance with SSPC-SP10. Bearing assemblies shall be cleaned of any surface contamination using suitable solvents in accordance with SSPC-SP1 and then given a near white metal blast cleaning in accordance with SSPC-SP10.

**2408.30, A, 1, Non-weathering Structural Steel Applications**

**Replace** the last sentence:

All surfaces to be top coated shall be clean in accordance with the specification requirements and dry.

**2408.30, A, 2, Weathering Structural Steel Applications**

**Replace** the second paragraph:

To ensure uniform weathering, all unpainted areas of outside surfaces of the fascia girders shall receive, after blasting, at least three uniform applications of water mist at 24 hour interval between applications. Each application shall be applied on dry surfaces. The water mist application shall be performed within 48 hours after the painted surfaces have been properly cured. All water mist application shall be witnessed by a representative of the Contracting Authority.

**2408.30, B, 1, b, Prime Coat**

**Replace** the 5th sentence:

Steel members with coating areas measuring less than 3 mils (75µm) that have not been corrected within 24 hours shall be completely reblasted and repainted.

**2408.30, B, 1, c, Top Coat**

**Replace** the first sentence of the first paragraph:

When designated by the contract documents, a top coat of waterborne acrylic paint shall be shop applied to all primed surfaces. The galvanized fasteners shall be painted in accordance with Article 2408.30, B, 1, d after bolting.

**Add** as the fourth sentence of the first paragraph:

To avoid moisture condensation, top coat shall be kept under a roof, protected from dirt, dust, and moisture, in an area where the temperature is maintained above 40°F (5°C) for a minimum of 24 hours after painting is completed.

**2408.30, B, 1, e, Cleaning of Paint System**

**Replace** the title:

**e. Cleaning of Paint Surfaces.**

**2408.30, B, 2, Weathering Structural Steel Applications**

**Replace** "30045" with 20045" in the sixth sentence of the first paragraph.

**Replace** the seventh sentence of the first paragraph:

The top coat shall cover all the primed surfaces except faying surfaces of bolted joints with a uniform film of paint.

**2408.30, B, 2, d, Weathering Structural Steel Applications**

**Replace** the entire article:

- d. Exterior surfaces of all galvanized components which are indicated in the plans to be painted and all galvanized floor drains shall be prepared according to the written recommendations of the paint manufacturer and painted with the same type of waterborne acrylic paint used for top coat as noted in this specification.

**Section 2409****2409.11, Bracing**

**Replace** the first sentence:

The ends of bracing shall be bolted through the pile, post, or cap with bolts not less than 5/8 inch (16 mm) in diameter.

**Section 2412****2412.02, Materials**

**Replace** the first sentence of the second paragraph:

Concrete used shall meet the requirements for C-4WR, C-L4WR, and C-V47B concrete mixtures, as specified in Materials I.M. 529.

**Replace** the ~~fourth and fifth~~ **third** paragraphs:

Retarding admixture may be required by the contract documents or by the Engineer. A water reducing/retarding admixture meeting the requirements of Materials I.M. 403, Appendix B, shall be used in accordance with Section 2403. When placements require extended working times, the dosage rate shall be increased for the appropriate working time and temperature. For placements requiring normal working times, the dosage rate shall be in accordance with Section 4103. Other admixtures may be approved by the Engineer.

**2412.04, Placing Reinforcement**

**Add** as new second sentence of the first paragraph:

Welding of reinforcing steel will not be permitted unless specified in the contract documents or approved by the Engineer.

**2412.06, Surface Finish**

**Add** as new fifth paragraph:

When the surface being placed is the final surface of a bridge sidewalk, the surface of sidewalk shall be given a transverse coarse broom texture.

**2412.07, Curing**

**Replace** the second sentence of the first indented paragraph:

The first layer of prewetted burlap shall be placed on the floor within 15 minutes after final finishing (texturing) and covering of concrete with white pigmented curing compound. The Engineer may adjust the time for placement of the first layer of prewetted burlap to minimize burlap damage to the transverse grooving.

**2412.11 Method of Measurement and Basis of Payment**

**Replace** the first sentence of the first paragraph:

Structural concrete, reinforcement, and structural steel will be measured and paid for in accordance with Sections 2403, 2404, and 2408, respectively.

### Section 2413

#### 2413.09, Sealing

**Replace** the first sentence of the first paragraph:

~~Faces of curbs~~ The tops and traffic sides of curbs, retrofit barrier rails, and concrete barrier rails shall be sealed in accordance with Article 2403.21, D.

#### 2413.12, Basis of Payment

**Replace** the first sentence of the fourth indented paragraph:

When there is no item for Class B Bridge Floor Repair, but such work is required, payment for each square yard for 5 square yards (square meter for 4 m<sup>2</sup>) or less will be at three times the contract unit price per square yard (square meter) for Class A Bridge Floor Repair.

### Section 2414

#### 2414.07, A, Concrete Railings

**Add** as the last paragraph:

When the contract documents include an item for Electrical Circuits, measurement will be in accordance with Article 2523.22, B. When electrical conduit and junction boxes are installed as part of Article 2525, measurement will be in accordance with Article 2525.10. Otherwise, electrical conduit and junction boxes will not be measured.

#### 2414.08, A, Concrete Railings

**Add** as the third paragraph:

When the contract documents include an item for Electrical Circuits, payment will be in accordance with Article 2523.23, B. When electrical conduit and junction boxes are installed as part of Article 2525, payment will be in accordance with Article 2525.10. Otherwise, electrical conduit and junction boxes will be incidental to the concrete railing.

### Section 2416

#### 2416.054, E, Joints for Concrete Pipe

**Replace** "Type C-1" with "Type C" in the first sentence of the third paragraph.

#### 2416.05 Method of Measurement

**Replace** the entire article:

The quantity of pipe culvert in feet (meters), will be the quantity shown in the contract documents for each culvert to the nearest foot (0.1 m) with no deductions for elbows, tees, and other fittings, but not including aprons. The quantity of pipe will be determined along the axis. Pipe laterals terminating at a tee will be from the point of inlet to a point 6 inches (150 mm) from the outside of the main, less the length of the apron, if any.

The quantity of aprons will be the quantity shown in the contract documents.

The quantity of appurtenances (elbows, tees, and other fittings) will be shown on the contract documents but will not be measured for payment.

Type C adaptors required by the contract documents or installed to correct faulty work will not be measured for payment. Type C adaptors not shown in the contract documents, but required because of changes in alignment, shall be paid for in accordance with Article 1109.03, B.

Excavation for roadway culverts will be measured for payment as provided in Article 2402.12, B. Excavation for entrance culverts will not be measured for payment. Sand required for Class B bedding will not be measured for payment.

When granular backfill is required and furnished, Article 2402.12, D, shall apply.

When foundation treatment material has been placed at the direction of the Engineer, Article 2402.12, E, shall apply.

#### **2416.06 Basis of Payment**

##### **Replace the entire article:**

The Contractor will be paid the contract unit price for pipe culvert of type and size specified per linear foot (meter). The cost of wrapping pipe joints, Type C adapters, and appurtenances shall be included in the contract unit price per linear foot (meter) for the pipe culvert.

The Contractor will be paid the contract unit price for aprons of the size specified per unit.

For the quantity of excavation for roadway culverts and the quantity of extra excavation for embankments, the Contractor will be paid the contract unit price per cubic yard (cubic meter). For entrance culverts, excavation shall be considered as incidental to the contract unit price for rigid pipe culvert. Sand required for Class B bedding shall be incidental to the contract unit price for pipe culvert.

When Granular backfill is required and furnished, **it** will be paid for in accordance with Article 2402.13, F.

Foundation treatment material furnished and placed will be paid for in accordance with Article 2402.13, E.

### **Section 2417**

#### **2417.06, Method of Measurement**

##### **Replace the entire article:**

The quantity of corrugated pipe culvert, in feet (meters), will be the quantity shown in the contract documents, for each culvert to the nearest foot (0.1 m), but not including apron. The quantity of pipe will be determined along the axis. Pipe laterals terminating at a tee will be measured from the point of inlet to a point 6 inches (150 mm) from the outside of the main, less the length of the apron, if any.

The quantity of aprons will be the quantity shown in the contract documents.

The quantity of appurtenances (elbows, tees, and other fittings) will be shown on the contract documents but will not be measured for payment.

Excavation for roadway culverts will be measured in accordance with Article 2402.12, B. Excavation for entrance culverts will not be measured for payment.

When granular backfill is required and furnished, measurement will be in accordance with Article 2402.12, D.

When foundation treatment material has been placed at the written direction of the Engineer, measurement will be in accordance with Article 2402.12, E.

#### **2417.07, Basis of Payment**

##### **Replace the entire article:**

The Contractor will be paid the contract unit price for corrugated pipe culvert of the type and size specified per linear foot (meter). Appurtenances shall be included in the contract unit price per linear foot (meter) for the corrugated pipe culvert.

The Contractor will be paid the contract unit price for aprons of the size specified per unit.

For the quantity of excavation for roadway culverts and the quantity of extra excavation for embankments, the Contractor will be paid the contract unit price per cubic yard (cubic meter).

For entrance culverts, excavation shall be considered as incidental to the contract unit price for corrugated pipe culverts.

When Granular backfill is required and furnished, it will be paid for in accordance with Article 2402.13, F.  
 Foundation treatment material furnished and placed will be paid for in accordance with Article 2402.13, E.

**Section 2418**

**2418.06, Method of Measurement**

**Replace** the first paragraph:

The quantity of jacked pipe culvert, in feet (meters), will be the quantity shown on the contract documents, for each jacked pipe culvert to the nearest foot (0.1 m), but not including aprons. The quantity of jacked pipe culvert will be determined along the axis.

**2418.07 Basis of Payment**

**Replace** the entire article:

The Contractor will be paid the contract unit price for jacked pipe culvert of the type and size specified per linear foot (meter). This payment shall be full compensation for materials, labor, and equipment necessary to complete the work. Culverts that consist of both jacked pipe culvert and conventionally placed pipe culvert will include separate bid items for each portion.

**Section 2420**

**2420.12, Method of Measurement**

**Replace** the first paragraph:

The quantity of structural pipe culvert, in feet (meters), will be the quantity shown in the contract documents for each culvert to the nearest foot (0.1 m). The quantity of pipe will be determined as follows:

**2420.13, Basis of Payment**

**Replace** the entire article:

The Contractor will be paid the contract unit price for structural pipe culvert of the type and size specified per linear foot (meter). This payment shall be full compensation for furnishing all materials, labor, and equipment necessary to complete the work.

Excavation for structures, structural concrete, and reinforcement will be paid for separately.

**Section 2422**

**2422.02, Materials for Unclassified Pipe Culvert**

**Add** as the last table in this article:

<b>UNCLASSIFIED ROADWAY LETDOWN PIPE CULVERT</b>	
Coated Corrugated Iron or Steel	Section 2417
Polyethylene Pipe	Section 2417

**2422.04 Method of Measurement**

**Replace** the first paragraph:

Unclassified pipe culverts will be measured as provided in Articles 2416.05 and 2417.06.

**2422.05 Basis of Payment**

**Replace** the entire article:

Payment for unclassified pipe culverts will be as provided in Articles 2416.06 or 2417.07.



## Division 25. Miscellaneous Construction.

### Section 2501

#### 2501.05, Steel H-Piles

**Add** as new second paragraph:

The number of permitted welds used to develop plan specified lengths of steel H-piles shall be limited to the following:

Plan Pile Length Feet (m)	Number of Permitted Welds (splices)
0 – 50 (0-15.0)	0
51-100 (15.1-30)	1
101-150 (30.1-45.0)	2

Welds (splices) in excess of the number specified above will not be permitted unless required for a pile extension. When steel H-piles are to be spliced, the shortest pile length shall be the last added length.

### Section 2503

#### 2503.02, Materials

**Replace** “Article 4149.02” with “Article 4149.03” in the second paragraph.

#### 2503.03, B, Laying and Placing Pipe

**Replace** “Type C-1 connections” with “Type C adapters” in the second sentence of the second paragraph.

#### 2503.04, Method of Measurement

**Replace** the first paragraph with a new first, second, and third paragraphs:

The quantity of storm sewer pipe, in feet (meters), will be the quantity shown in the contract documents, for each storm sewer to the nearest foot (0.1 m). Such lengths shall exclude the space across catch basins, intakes, and utility access where pipe is not actually placed.

Type C adapters required by the contract documents or installed to correct faulty work will not be measured for payment. Type C adapters not shown in the contract documents, but required because of change in alignment, shall be paid for in accordance with Article 1109.03, B.

The quantity of aprons will be the quantity shown in the contract documents.

#### 2503.05, Basis of Payment

**Replace** the first paragraph:

The Contractor will be paid the contract unit price for storm sewer pipe of the type and size specified as follows:

**Replace** “as extra work” with “in accordance with Article 1109.03, B” in the last paragraph.

#### 2503.05, A

**Replace** the last sentence of the first indented paragraph:

For depths of excavation more than 1 foot (0.3 meter) below the specified bedding elevation, shown in the contract documents, payment for overdepth excavation will be made in accordance with the following schedule:

**2503.05, E**

**Replace** the entire article:

**E.** Type C adapters shown in the contract documents or installed to correct faulty quality of work will be included in the cost per foot (meter) of pipe. Type C adapters required because of change in alignment will be paid for in accordance with Article 1109.03, B.

The Contractor will be paid the contract unit price for aprons of the type and size specified per unit.

**2503.05, F**

**Replace** “as extra work as provided in” with “in accordance with” in the second sentence.

**Section 2504****2504.05, Method of Measurement**

**Replace** the first sentence of first paragraph:

The quantity of sanitary sewer pipe, in feet (meters), to the nearest foot (0.1 m), of each size of sanitary sewer placed will be the quantity shown in the contract documents. The number of utility accesses and lamp holes will be the quantity shown in the contract documents.

**Add** as new second paragraph:

Aprons and appurtenances of the type specified will be measured in accordance with Articles 2416.05 or 2417.05.

**2504.06, Basis of Payment**

**Replace** the first paragraph:

When the contract documents indicate the depth of sanitary sewer excavation and the pipes have been laid substantially to the elevation of the flow line indicated, the Contractor will be paid the contract unit price per linear foot (meter) of sanitary sewer complete and the contract unit price for each lamp hole and utility access complete. The Contractor will be paid the contract unit price for sanitary sewer pipe of the type and size specified per linear foot (meter).

**Add** as new second paragraph:

Aprons and appurtenances of the type specified will be paid in accordance with Articles 2416.06 or 2417.06.

**Replace** “as extra work as provided in” with “in accordance with” in the first sentence of the third paragraph.

**Replace** the fourth paragraph:

This payment shall be full compensation for furnishing all material, labor, and equipment necessary to complete the work including excavation, backfilling, constructing utility accesses and lamp holes, special shaping through utility accesses and lamp holes, and removal of excess material from the project. **It shall include furnishing sections of pipe for inlet and outlet lines through walls of utility accesses and lamp holes.**

**Section 2506****2506.06, Placement of Mortar as Culvert Backfill**

**Replace** “Section 4133” with “Article 2506.02, G,” in the first sentence of the third paragraph.

**Section 2507****2507.02, B, 2, Fly Ash**

**Replace** the second sentence:

Fly ash may be substituted for cement for up to 25% by weight (mass) of cement.

**2507.02, C, Filter Blanket**

**Add** title and article:

**C. Filter Blanket.**

Article 2107.11 shall apply.

**Section 2508**

**2508.01, B, 7, f, Prior to Painting**

**Replace** "Article 2508.01, B, 6, e" with "2508.02, E, 4" in the first paragraph.

**Replace** "Article 2508.01, B, 6, e" with "2508.02, B, 2" in the second paragraph.

**Replace** "Article 2508.01, B, 6, e" with "2508.02, E, 7" in the third paragraph.

**2508.02, D, Acceptable Products.**

**Replace** "Materials I.M. 482" with "Materials I.M.s 482.02 through 482.06 in the first paragraph.

**2508.04, A, Bridge Cleaning**

**Replace** the title and first sentence:

**A. Bridge Cleaning for Painting.**

The Contractor will be paid the lump sum contract price for Bridge Cleaning for Painting.

**Section 2510**

**2510.02, Removal of Pavement**

**Delete** the last sentence of the second paragraph:

~~If processing is require, the processing will be defined elsewhere in the contract documents.~~

**2510.02, C, PCC Pavement with HMA Resurfacing (Composite Pavement Section)**

**Replace** the entire article:

The contract documents may specify that the HMA Resurfacing be removed from the PCC pavement as a separate operation. When not specified, the Contractor may remove the composite pavement as a single operation.

**2510.02, D, Removal and Crushing of Pavement**

**Add** as article D:

**D. Removal and Crushing of Pavement.**

The contract documents may require the pavement be removed and crushed. When required, the contract documents will specify the size and/or gradation the pavement shall be crushed to, and specify where the crushed material is to be stockpiled or used in the contract.

**2510.04, D, Pavement Scarification**

**Add** as article D:

**D. Pavement Scarification.**

The quantity of pavement in square yards (square meters) where the HMA Resurfacing has been scarified prior to the removal of the pavement will be considered the area of pavement scarification. HMA Resurfacing removed and crushed with the PCC pavement will be included in the area of pavement scarification if the composite crushed material meets the gradation and composition required by the contract documents.

**2510.04, E, Removal and Crushing of Pavement**

**Add** as article E:

**E. Removal and Crushing of Pavement.**

The quantity removed and crushed, of pavement in square yards (square meters) in accordance with the contract documents will be considered the area of removal and crushing of pavement.

**2510.05, A, Removal of Pavement**

**Delete** the last sentence of the first paragraph:

~~The cost of saw cut, removal of utility accesses, intakes, and integral and separate curb shall be included in the contract unit price for the removal and crushing of pavement.~~

**Add** as the second and third paragraphs:

When recycling is not mandatory, the cost of recycling pavement removal into granular subbase, granular shoulders, or special backfill shall be included into the cost of the items for which the recycled pavement material will be used.

The cost of saw cut, removal of utility accesses, intakes, and integral and separate curb shall be included in the contract unit price for the Removal of Pavement, Pavement Scarification, or Removal and Crushing of Pavement.

**2510.05, D, Pavement Scarification**

**Add** as article D:

**D. Pavement Scarification.**

The quantity of pavement where the HMA Resurfacing has been scarified, in square yards (square meters), will be paid for at the contract unit price.

**2510.05, E, Removal and Crushing of Pavement**

**Add** as article E:

**E. Removal and Crushing of Pavement.**

The quantity of pavement removed and crushed, in square yards (square meters), in accordance with the contract documents will be paid for at the contract unit price.

**Section 2511****2511, Removal and Construction of Portland Cement Concrete Sidewalks and Recreational Trails.**

**Replace** the title and entire article.

**Section 2511. Removal and Construction of Portland Cement Concrete Sidewalks and Recreational Trails****2511.01 DESCRIPTION.**

This work shall consist of removal of sidewalks and recreational trails or portions of them and/or the construction of new sidewalks and recreational trails according to the contract documents.

**2511.02 MATERIALS.****A. Portland Cement Concrete.**

The Portland cement concrete used for sidewalks and recreational trails shall be Class B concrete produced and placed in accordance with Section 2301. For sidewalk and recreational trail construction included in PCC paving projects, the Contractor may use the approved paving mixture for the project. A Class 2 durability or better aggregate, in accordance with Article 4115.04, A, will be required.

When construction of a sidewalk or recreational trail is associated with a bridge project the Contractor may use the concrete approved for the bridge structure with Class C as the minimum.

**B. Hot Mix Asphalt.**

The HMA used for sidewalks and recreational trails not adjacent to pavement shall be 100,000 ESAL, 3/8 inch (9.5 mm) in accordance with Section 2303. When the recreational trail or sidewalk is adjacent to the pavement and also functions as the pavement shoulder, 1,000,000 ESAL, 1/2 inch (12.5 mm) base mixture shall be used. The Performance Grade binder shall be PG 58-28 or PG 52-34 as specified in the plans.

**C. Subbase and Granular Surface.**

The subbase and granular surface shall be as specified in the contract documents.

**2511.03 CONSTRUCTION.****A. Removal of Sidewalks and Recreational Trails.**

The Contractor shall remove the sidewalks and recreational trails as shown in the contract documents. If only portions of the sidewalks or recreational trails are to be removed, the boundaries of removal shall be made by a vertical saw cut not less than 1 inch (25 mm) deep before breaking the removal. Any areas of the sidewalk or recreational trail not designated for removal but which are removed, broken, or damaged by the Contractor's operations shall be removed and replaced by the Contractor with no additional cost to the Contracting Authority. Removal of sidewalks and recreational trails shall be in accordance with Article 2510.02.

**B. Preparation of Subgrade.****1. Sidewalks.**

The subgrade for sidewalks shall be prepared by excavating or filling with suitable earth to a depth below the finished grade line so that, when tamped or rolled until smooth, firm, and hard, the subgrade will be uniform and at the required depth below the finished grade line.

**2. Recreational Trails.**

When the recreational trail is to be constructed on natural subgrade special compaction of subgrade for the recreational trail will be required. The Contractor shall disk, scarify, mix, and recompact the top 12 inches (300 mm) of subgrade with moisture and density control. Compact to not less than 95% maximum density as determined by Iowa DOT Materials Laboratory Test Method 103; moisture content not less than optimum or more than 4% above optimum moisture content.

When the recreational trail surface is to be constructed on an existing granular surface, the subbase (existing granular surface) shall be prepared in accordance with the contract documents.

**C. Portland Cement Concrete.****1. Placing.****a. Hand Finished Sidewalks and Recreational Trails.**

Forms of wood or steel shall be in accordance with Article 2301.07, A, 1, b.

The subgrade shall be thoroughly moistened. Concrete shall be deposited for the full depth of slab in one operation. It shall be consolidated by tamping or vibration, and the excess concrete screeded off flush with the forms. Edges adjacent to all forms, expansion joints, curbs, or fixtures in the surface shall be thoroughly consolidated.

**b. Slip Form Sidewalks and Recreational Trails.**

Self propelled slip form pavers shall meet the requirements of Section 2301. Other slip form paving machine shall be approved by the Engineer and designed for the specific purpose of placing, consolidating, and finishing concrete sidewalk and recreational trail slabs without use of fixed side forms.

**2. Finishing.**

After consolidation, the concrete surface shall be finished to a uniform, slip resistant, wet burlap drag or broom finish texture true to the line and grade specified in the contract documents. The broom

finish shall be obtained by dragging a suitable broom transversely across the surface of the plastic concrete.

**a. Sidewalks.**

After the surface has been floated, the edges of the slabs shall be finished with a suitable edging tool. Unless otherwise shown, the finished surface shall have a cross slope of 1/4 inch per foot (20 mm/m) for drainage.

For PCC sidewalks the transverse joint spacing shall be equal to the pavement width. The concrete shall be cut through for not less than 25% of the depth with a pointed trowel or suitable spading tool, and the concrete edged on both sides. In lieu of using a pointed trowel or suitable spading tool, the Contractor may cut these lines within 12 hours after placement of concrete with a 1/8 inch (3 mm) blade saw that is approved by the Engineer. Metal dividers will be considered for approval, in lieu of cutting.

**b. Recreational Trails.**

For PCC recreational trails the transverse joints spacing shall be equal to the pavement width. All transverse joints shall be saw cut not tooled. The transverse joints shall be cut 1/8 inch (3 mm) wide and not less than 1 inch (25 mm) in depth. No sealant will be required.

Recreational trails 12 feet (2.6 m) wide or less, shall not have a longitudinal joint.

**3. Protection and Curing.**

After finishing, the concrete shall be cured and protected by one of the methods described in Article 2301.19.

**4. Isolation Joints.**

Isolation joints shall be constructed at all points where sidewalks or recreational trails meet other walks, curbs, or fixtures in the surface. These joints shall be constructed by installing a 1/2 inch (13 mm), full depth strip of approved premolded joint material.

**5. Time for Opening Pavement for Use.**

PCC sidewalks and recreational trails shall be opened a minimum of 7 days after placement or when flexural strength reaches 400 psi (2.75 MPa) as determined by Materials I.M. 383.

**D. Hot Mix Asphalt.**

HMA sidewalks and recreational trails shall be constructed in accordance with Article 2303.03 and 2303.04. Compaction shall be Class 1C.

**E. Smoothness.**

Sidewalk and recreational trail smoothness shall be in accordance with Article 2301.16, D, except for the requirements for pavement and bridge approach sections for Primary projects.

Areas may be checked by the Engineer with a surface checker and shall not exceed 1/4 inch in 10 feet (6 mm in 3 m). For each bump exceeding these requirements, the Contractor will be assessed \$50 or the bump corrected as agreed upon by the Engineer and Contractor.

**F. Weight Limits.**

Construction equipment on both PCC and HMA sidewalks and recreational trails shall be limited to 5 ton (5 Mg).

**G. Pavement Markings.**

Pavement markings shall be placed in accordance with Section 2527.

**2511.04 METHOD OF MEASUREMENT.**

**A. Removal of Sidewalks or Recreational Trails.**

The quantity of sidewalk or recreational trail removed, in square yards (square meters), will be the quantity shown in the contract documents.

**B. Construction of Sidewalks or Recreational Trails.**

The quantity of Sidewalk or Recreational Trail constructed of the material type and depth specified, in square yards (square meters), will be the quantity shown in the contract documents. Deductions will not be made for fixtures having an area of 1 square yard (1 m<sup>2</sup>) or less.

**C. Special Compaction of Subgrade for Recreational Trail.**

The quantity of Special Compaction of Subgrade for Recreational Trail, in stations (meters), will be the quantity shown in the contract documents.

**2511.05 BASIS OF PAYMENT.****A. Removal of Sidewalks or Recreational Trails.**

The Contractor will be paid the contract unit price for Removal of Sidewalk or Removal of Recreational Trail per square yards (square meters). This payment shall be full compensation for all equipment, labor, and disposal for removal of the sidewalk or recreational trail as specified in the contract documents.

**B. Construction of Sidewalks or Recreational Trails.**

The Contractor will be paid the contract unit price for construction of Sidewalk or Recreational Trail, of the material type and thickness specified, per square yard (square meter). This payment shall be full compensation for furnishing all material, equipment, and labor to construct the sidewalk or recreational trail in accordance with the contract documents.

**C. Special Compaction of Subgrade for Recreational Trail.**

The Contractor will be paid the contract unit price for Special Compaction of Subgrade for Recreational Trail, per station (meter). This payment shall be full compensation for furnishing all material, equipment, and labor to construct the special compaction of subgrade for recreational trail in accordance with the contract documents.

**Section 2513****2513.01, Description**

**Replace** the first sentence of the first paragraph:

The provisions of this section shall apply to production and construction of concrete barrier, both permanent and temporary, as shown in the contract documents.

**Add** as the second sentence of the last paragraph:

F-shape TBR, Type A, as defined in the Standard Road Plans, shall be used in all situations requiring the railing to be in place during the winter work period as defined in Article 1108.02, paragraph E.

**2513.03, A, Precast**

**Replace** the last paragraph:

The air content of fresh, unvibrated concrete shall be 7.0%, as a target value, with a maximum variation of plus 1.5% or minus 1.0%.

**2513.03, B, 4**

**Replace** the third sentence:

The air content of fresh, unvibrated concrete shall be 7.0%, as a target value, with a maximum variation of plus 1.5% or minus 1.0%.

**2513.03, B, 5, Fly Ash**

**Replace** the entire article:

5. Fly Ash and GGBFS. The conditions and allowable rates of fly ash and GGBFS substitution shall be in accordance with Article 2403.03, D. Fly ash and GGBFS substitution will not be permitted in slip form barrier rail placed in the time period from October 16 through March 15.

**2513.06, B, Curing**

**Add** as the second sentence:

Clear curing compound shall be applied to the concrete barrier rail within 15 minutes after final finishing provided that the free water (sheen) has appreciably disappeared from the concrete surface.

**Section 2517****2517, Concrete Header Slabs**

**Replace** the title and entire section.

**Section 2517. Railroad Approach Sections****2517.01 DESCRIPTION.**

This work shall consist of construction of pavement sections at junctures in accordance with the contract documents.

**2517.02 MATERIALS.**

Materials for construction of railroad approach sections shall meet requirements of Division 41 for the respective material.

**A. PCC Paving Projects.**

The PCC shall be of the same class as specified for the pavement.

**B. HMA Paving Projects.**

The HMA mixture shall be one step above the adjoining surface course. The asphalt binder shall be PG 64-22.

**2517.03 CONSTRUCTION.****A. PCC Paving Projects.**

The PCC shall be formed, placed, finished, and cured in accordance with Section 2301.

The Engineer may require the railroad approach section to be placed one lane at a time for the convenience of the traveling public. When the header slab is constructed in two sections, a centerline joint shall be constructed as shown in the contract documents. When the joint is not provided for, 1/2 inch (No. 15) tie bars shall be placed not more than 4 feet (1.2 m) apart and shall extend not less than 18 inches (450 mm) into each section.

**B. HMA Paving Projects.**

The HMA shall be placed in accordance with Article 2303.03, C, with maximum 2 inch (50 mm) lifts. Compaction shall be in accordance with Article 2303.03, D, Class 2.

**2517.04 METHOD OF MEASUREMENT.****A. Railroad Approach Section, PCC.**

The quantity of Railroad Approach Section, PCC, in square yards (square meters), will be the quantity shown in the contract documents.

**B. Railroad Approach Section, HMA.**

The quantity of Railroad Approach Section, HMA, in square yards (square meters), will be the quantity shown in the contract documents.

**2517.05 BASIS OF PAYMENT.****A. Railroad Approach Section, PCC.**

The Contractor will be paid the contract unit price for Railroad Approach Section, PCC, per square yard (square meter). This payment shall be full compensation for excavation for modified subbase and subdrain; furnishing and installing subdrain; furnishing and installing subdrain outlet; furnishing and



placing porous backfill; furnishing and backfilling modified subbase; and furnishing and installing reinforcing steel, tie bars, and dowel assemblies.

**B. Railroad Approach Section, HMA.**

The Contractor will be paid the contract unit price for Railroad Approach Section, HMA, per square yard (square meter). This payment shall be full compensation for excavation for HMA, modified subbase, and subdrain; furnishing and installing subdrain; furnishing and installing subdrain outlet; furnishing and placing porous backfill; furnishing and backfilling modified subbase; and furnishing and installing fiber board barrier.

**Section 2521**

**2521.02, Requirements**

**Replace** “Materials I.M. 213 and 214” with “Materials I.M. 213”.

**Section 2522**

**2522.04, D**

**Replace** the entire article:

Each anchor bolt shall be furnished with one leveling nut and two anchoring nuts. Anchor bolts shall meet the requirements of ASTM F 1554, Grade 105 (724 MPa), be full-length galvanized, and be high-strength low alloy steel. Unless otherwise specified, anchor bolts shall be the Unified Coarse Thread Series and have Class 2A tolerance. The end of each anchor bolt intended to project from the concrete shall be color coded in red to identify the grade. Washers shall be galvanized and shall meet the requirements of ASTM F 436. Nuts shall meet the requirements of ASTM A 563, DH, be heavy hex, and be galvanized. Nuts may be over-tapped in accordance with the allowance requirements of ASTM A 563. Galvanizing shall meet the requirements of ASTM A 153, Class C; or ASTM B 695, Class 50.

**Section 2525**

**2525.03, A, 6, Uninterrupted Timing**

**Replace** “Article 2525.04, A, 11, and A, 12, a” with “Article 2525.03, A, 2, b, and Article 2525.03, A, 5” in the first sentence.

**2525.03, C, 11, i, 1, Connecting Cables**

**Delete** “correlations shall be made with connecting cable plug and controller jack as described in Article 2525.05, A, 2, 6.” In the last sentence.

**2525.03, C, 11, j, 1, Incoming AC Line**

**Replace** “Article 2525.05, A, 12, d, 2, a” with “Article 2525.03, C, 11, i, 2, a”.

**2525.03, F, 4, d**

**Replace** “Paragraph A, 10, of this Article” with “2525.03, C”.

**2525.06, B, 2**

**Replace** the entire article:

The anchor bolts shall meet the requirements of ASTM F 1554, Grade 105 (724 MPa), be full-length galvanized, and have a full-body diameter. Anchor bolts shall be the Unified Coarse Thread Series and have Class 2A tolerance. The end of each anchor bolt intended to project from the concrete shall be color coded in red to identify the grade. Washers shall be galvanized and shall meet the requirements of ASTM F 436. Nuts shall meet the requirements of ASTM A 563, DH, be heavy hex, and be galvanized. Nuts may be over-tapped in accordance with the allowance requirements of ASTM A 563. Galvanizing shall meet the requirements of ASTM A 153, Class C; or ASTM B 695, Class 50.

**2525.06, C, 3**

Replace "115 m" with "115 mm" in the article.

**2525.07 Method of Measurement and Basis of Payment**

Replace the second sentence of the first paragraph:

Payment will be made at the lump sum contract unit price for traffic signalization. The Contractor will be paid the contract lump sum price for Traffic Signalization.

**Section 2526****2526. Construction Survey**

Replace the entire article:

**2526.01 DESCRIPTION.**

This work involves survey for construction projects. The Contractor shall furnish ~~the all~~ survey necessary for construction of the project ~~as intended by the contract documents and approved revisions before work begins in the area~~. The provisions of Article 1105.06 do not apply to this work, except that the original stakes set by the Engineer shall be preserved. If, in the opinion of the Engineer, any of the original survey stakes or ~~bench~~ marks have been ~~carelessly or willfully~~ destroyed or disturbed by the Contractor, the cost of replacing shall be charged to the Contractor. ~~Design errors discovered shall be brought to the Engineer's attention for review prior to staking~~. Construction survey shall include qualified personnel, equipment, and supplies required for, but not limited to, the following items:

**A. Project Control.****1. Primary Control Monuments.**

A primary control monument is a survey point established by the Department prior to project commencement and shown in the contract documents. The point will be established by placing a monument in the ground.

**2. Secondary Control Monuments.**

A secondary control monument is a survey point established by the Contractor on grading or other projects specified in the plans, and preserved by the Contractor on all other projects.

The Engineer will provide monuments, similar to those used for Global Positioning System (GPS) control by the Department.

Secondary permanent horizontal control monuments shall be placed, as directed by the Engineer, at locations likely to survive project construction and at intervals not to exceed 2,640 feet (0.8 km). The Contractor shall place the monuments in the ground along the project corridor. Monuments shall be placed at higher elevations along the corridor to provide a view of the immediate project topography and provide for visible clear line of sight to the nearest secondary permanent control monument in either direction. Primary project monuments may be substituted if appropriate.

The monument shall be planted 1 to 4 inches (25 mm to 100 mm) below existing ground. A metal fence post shall be driven within 1 foot (0.3 m) to mark its location.

Project coordinates shall be carefully determined relative to the nearest primary project control monument using project coordinate values provided by the Engineer. The resulting error radius of the secondary monument shall not exceed 0.10 feet (30 mm)  $\pm 2$  ppm relative to the primary control. Unedited printed and/or electronic formatted field data of the field survey shall be provided to the Engineer along with an ASCII comma delineated file of the coordinates formatted as (Point Number, Northing, Easting, Elevation, Point Description, Feature).

An independent traverse check between the secondary control monuments shall be performed by observing distance and angular measurements or by use of GPS. An unedited printed and/or

electronic file of the field data for the traverse check shall be provided to the Engineer. A diagram shall be provided to the Engineer indicating horizontal ground distances to nearest 0.01 foot (3 mm) and angles to at least the nearest 10 inches (250 mm) between each secondary control monument. Inverses between the coordinate pairs as determined in the previous paragraph shall not exceed 0.10 feet (30 mm) of the direct measurements.

Secondary control monuments that are disturbed during construction activities will be replaced using procedures outlined above at the no additional expense to the Contracting Authority.

### 3. Durable Physical Objects.

Each control monument shall be referenced to at least three durable physical objects from 20 to 100 feet (6 m to 30 m) away from the monument with measurements to the nearest 0.10 foot (30 mm). Durable physical objects could include trees, poles, fence posts, station marks in new roadway pavement, or metal fence posts. A printed and/or electronic reference image (for example .JPG, TIFF, etc), including each reference and project coordinate, shall be provided to the Engineer.

### 4. Benchmarks.

Permanent vertical control benchmarks shall be established at all bridges and reinforced concrete box culverts within the project. An I.D.O.T. brass plug on bridge barrier rail or headwall of reinforced concrete box culvert shall be used to indicate the benchmark. The Contractor may use a sawn "X" on bridge barrier rail or headwall of reinforced concrete box culvert if approved by the Engineer.

All benchmark elevations shall be transferred from construction plan benchmarks to the permanent benchmarks using the three-wire method or by trigonometric leveling. Temporary benchmarks of reasonable stability shall be used to preserve the plan benchmarks.

All unedited printed and/or electronic formatted field benchmark elevation data will be furnished to the Engineer. The project x and y coordinates of all benchmarks shall be provided to the Engineer. An ASCII comma delineated file of the coordinates formatted as (Point Number, Northing, Easting, Elevation, Point Description, Feature).

Benchmark level loops shall not exceed an error of 0.05 feet (15 mm) times the square root of the loop's length in miles (kilometers) and the error shall be distributed equally along the loop on all intermediate traverse/benchmark points.

## A B. Grading.

1. Right-of-way line between break points permanent right-of-way corners at 100 foot (approximately 25 20 m) intervals, or less if needed, including borrows, temporary easements, and right of entry. These points shall be marked by placement of a metal pin or wood hub, flat, and identified with a "flat" and lath adjacent to the hub at the same location as the slope stakes. The flat shall be clearly marked with the station number, and distance from centerline, and elevation (cut or fill) to subgrade. This work shall be accomplished within the first 20 working days.

2. Slope stakes at 100 foot (25 20 m) intervals, or less if needed, for all embankment and excavation work including roadway, channel changes, and borrow areas. Interpolations may be necessary to match the cross-sections. Slope stakes shall be set at the toe of the foreslope, and/or the top of the backslope. Slope stakes shall be marked with a flat and lath. The flat shall be clearly marked with the station location, distance, slope, and cut/fill information.

3. Grade check stakes every stakes at 100 feet (20 m) intervals for bottoms of subgrade treatments. Grade check stakes shall be set on centerline for two-lane roads and in the median for four-lane roads. Grade check stakes shall be marked with a lath. The lath shall be clearly marked with the station location and cut or fill information.

4. Finish grade stakes (blue tops) at 100 foot (20 m) intervals, or less at each shoulder line. In superelevated curves, also place a line of finish grade stakes at 100 foot (20 m) intervals on the upper side of the curve at the edge of the proposed pavement, if needed. The blue tops shall be set at each shoulder line and at each point where there is a change in cross slope. Blue tops shall be marked with a wood hub and a stake chaser or similar type tassel.

~~5. Cut or fill stakes to center line or shoulder line elevation at right-of-way line or an identified base line at 100 foot (25 m) intervals or less.~~

~~6. Take original and final cross sections elevations of all borrows, and side borrows, to be calculated by the Engineer. Provide original and final graphical cross sections at 100 foot (20 m) intervals, or less if needed, suitable for use by the Engineer to calculate excavation quantities.~~

~~7. Reference and preserve plan control points at:~~

~~Point of Curve (PC)~~

~~Point of Tangent (PT)~~

~~Point of Intersection (PI)~~

~~Point on Tangent (POT)~~

~~Both distance and angle or alternate method will be approved by the Engineer.~~

~~8. After grading is complete, reset all control points, as designated by the Engineer.~~

~~9. Set intermediate Bridge berm slope stakes at bridge abutments to establish all transitions including the face of the berm. Also place finish grade stakes on the centerline of abutment bearing and at the toe of slope of all bridge berms. Also place finish grade stakes (blue tops) on each side all roadway shoulder lines and roadway centerlines project down the face of bridge berms at the following points: top, midpoint, and toe.~~

~~Top of Bridge Berm~~

~~Mid-point of Slope of Bridge Berm~~

~~Toe of Bridge Berm~~

~~10. Where When Class 12 excavation is an item, cross section elevations shall be taken at top and bottom of rock for Engineer's computations at 100 foot (20 m) intervals, or less if needed, and cross sections plotted for use by the Engineer to calculate the excavation quantities.~~

~~11. Agricultural drain tile shown in the contract documents will shall be located on each side of roadway center line with station, offset, and flow line. at the right-of-way line with a lath. The lath shall be clearly marked to show station location, distance from centerline, tile size and type, and flowline elevation.~~

#### **D C. Bridges.**

~~1. Centerline of roadway or bridge.~~

~~2. Centerline of piers.~~

~~3. Centerline or face of abutment.~~

~~4. Elevation reference.~~

~~Locations and elevations shall be marked with metal pin or tack in a wood hub, flat, and lath. The flat shall be clearly marked with the pier/abutment station location, design number, and offset distance from the centerline of the approach roadway.~~

~~Minimum of three temporary benchmarks.~~

~~5. Location of test pile shall be marked with a wood hub.~~

~~6. Independent check of the above stakes.~~

~~7. Elevations of beams as erected. Provide the elevations to the Engineer for computation of finish elevations for deck construction. Locations for determining beam elevations shall be in accordance with the contract documents plans.~~

~~A copy of the staking diagram shall be provided to the Engineer before work begins.~~

**C D. Reinforced Concrete Box Culverts.**

1. ~~Centerlines (roadway and culvert).~~
2. ~~Back of parapet.~~
3. ~~Skew.~~
4. ~~Flow line elevations at inlet, outlet, and breaks.~~

~~(For both B and C above, a check for flow line and alignment shall be made and reported to the Engineer, if questionable.)~~

~~Locations and elevations shall be marked with metal pin or tack in a wood hub, flat, and lath. The flat shall be clearly marked with the station location, design number, cut/fill elevation, and offset distance from the centerline of the culvert and back of parapet.~~

5. ~~An independent check of the above stakes.~~

~~A copy of the staking diagram shall be provided to the Engineer before work begins.~~

~~Questionable flow lines and alignments that do not match existing drainage shall be reported to the Engineer.~~

**B E. Pipe Culverts.**

1. ~~Centerlines (roadway and culvert).~~
2. ~~Both ends.~~
3. ~~Flow line elevations at inlet, outlet, and breaks.~~

~~Locations and elevations shall be marked with metal pin or a wood hub, flat, and lath. The flat shall be clearly marked with the station location, cut/fill elevation, and offset distance to both ends or centerline of pipe.~~

~~Questionable flow lines and alignments that do not match existing drainage shall be reported to the Engineer.~~

**F. Sanitary and Storm Sewers.**

1. ~~Centerline.~~
2. ~~Flow line elevation.~~

~~Locations and elevations shall be marked with metal pin or tack in a wood hub, flat, and lath. The flat shall be clearly marked with the station location, pipe number, cut/fill elevation, and offset distance to centerline of pipe.~~

**G. Intakes and Utility Accesses**

1. ~~Location.~~
2. ~~Elevation of top and base.~~
3. ~~Back of curb.~~

~~Locations and elevations shall be marked with metal pin or tack in a wood hub, flat, and lath. The flat shall be clearly marked with the station location; intake or utility access number; cut/fill elevation, including bottom of well and form grade; and offset distance to the Station Location.~~

**E H. Pavements (PCC & HMA).**

1. Elevations on both sides at 50 foot (10 m) intervals on straight and level sections and at 25 foot (10 m) intervals on horizontal and vertical curves.

2. Alignment (tack line) on one side.

3. Reference, preserve, and re-establish control points mentioned in Paragraphs A, 7 and A, 8 of this specification.

4. At fixed elevations (bridges and existing pavements), elevations at center line and both pavement edges at 10 foot (3 m) intervals for 100 foot (30 m) shall be submitted to the Engineer to establish final elevations to be set by the surveyor.

Locations and elevations shall be marked with metal pin or tack in a wood hub (only tack one side), flat, and lath. Elevations on both sides of the pavement at 50 foot (10 m) intervals on straight and level sections and at 25 foot (10 m) intervals on horizontal and vertical curves. The flat shall be clearly marked with the station location, cut/fill information, and offset distance to the edge of pavement. Pavement cross slope information shall be included in superelevated curves.

Elevations of pavement centerline, and both edges at bridges and existing pavement, shall be taken at 10 foot (3 m) intervals for 100 feet (30 m). Final elevations shall be submitted to the Engineer for approval.

5. For PCC overlays and PCC and HMA inlays, in addition to the above requirements, the surveyor shall: When a new profile grade is not included in the contract documents the Contractor shall:

a 1. Obtain elevations of the existing shoulders and/or pavement as stated in Article 2526.01, E, 4. Article 2526.01, H.

b 2. Design a smooth profile grade line based on these elevations to provide the required pavement or shoulder thickness as detailed in the contract documents. This grade line shall tie into existing bridges, adjacent pavement and ramps, and provide the required pavement crown. This proposed grade line shall be submitted to the Engineer for approval.

**I. Pavement Overlays (PCC and HMA)**

Reference and preserve existing control points located at each Point of Intersection (P.I.).

Method used to reference points shall be approved by the Engineer.

Control Points shall be reset after the work is complete.

Office Relocations (O.R.) identified in the contract documents shall be staked from the original survey by the Contractor, including the control points as stated in Article 2526.01, A, 7. The method used by the Contractor to preserve project control shall be submitted to the Engineer for approval. Survey work documentation shall be in a format acceptable to the Contracting Authority. Survey work shall be done with a Professional Engineer licensed in the State of Iowa or a Professional Land Surveyor licensed in the State of Iowa in responsible charge, in accordance with provisions of Chapter 542 B, Code of Iowa. The Contractor shall submit to the Engineer a resume identifying the field survey personnel and their capabilities to perform the intended requirements.

The method of determining alignments and elevations and the method of preserving control points shall be subject to review and approval by the Engineer. This approval shall not act to relieve the Contractor of the responsibility for the correctness of the survey work. Plan cross-sections shall not be used for vertical or horizontal control.

The Engineer will provide benchmark elevations, right-of-way break points corners, center line control points (PC's, PT's, necessary PI's, and POT's on the original survey line, adequate for a line of vision), and

reference control points on the original survey as shown in the contract documents. for the Contractor's use. A GeoPak alignment will be provided if available. In the event the coordinate system is used, the control point or points and the x axis or the y axis will be set from which the surveyor will do the survey work.

Tie-ins with existing roadways shall be checked for correctness of alignment prior to construction staking. Design errors discovered in this checking shall be brought to the Engineer's attention for review prior to staking.

When survey work is done under traffic, detail sheets in the contract documents will establish the required signing.

The Engineer will compute finish elevations (using Contractor provided beam elevations) and furnish them to the Contractor for deck construction, locate and take determine elevations of settlement plates, and re-establish land corners and permanent reference marker.

The Contractor shall replace land corners and permanent reference markers unless otherwise stated in the contract documents.

All survey work documentation is to become property of the Contracting Authority. The work of this specification will be considered finished when the documentation is furnished to and accepted by the Engineer.

For the purpose of subcontracting, this item will be considered a specialty item.

#### **2526.02 METHOD OF MEASUREMENT AND BASIS OF PAYMENT.**

Construction survey will be measured and paid for at the lump sum contract price. This payment shall be full compensation for the survey work required for the project as let, including any interpolations that may be necessary between cross-section and field staking. Revisions after the letting will be paid for as extra work as described in Article 1109.03, B. The Engineer may make partial payments, in accordance with Article 1109.05, based on the estimate of the survey work completed. Final payment will be made at the time the survey books are submitted to the Engineer.

### **Section 2527**

#### **2527.02, B, 2, Epoxy**

**Replace** the title and entire article:

##### **2. Durable Paint Pavement Markings.**

Durable paint pavement markings shall meet requirements of Article 4183.04.

The marking thickness and reflective beads shall be applied according to Materials I.M. 483.04.

#### **2527.03, Construction**

**Replace** "epoxy" with "durable paint" in the third paragraph.

**Delete** the last sentence of the fourth paragraph:

~~For tape products, the manufacturer's recommendations shall be followed for surface dryness and other surface preparation requirements.~~

**Add** a new sixth paragraph with subparagraphs:

For tape products, the manufacturer's recommendations shall be followed for surface dryness, primers, adhesives, and other surface preparation requirements. Unless otherwise specified by the tape manufacturer the following test shall be met for determining surface dryness before applying the tape.

1. In an area of direct sunlight where the tape will be applied, place an 18 inch x 18 inch (450 mm x 450 mm) piece of polyethylene (a green or black garbage bag may be used). There should not be any holes or tears in the polyethylene.
2. Tape down all the edges of the polyethylene sheet to seal all the edges and not allow any air movement to get under the polyethylene.
3. Firmly tamp the tape using the tamper cart or by foot tamping.

4. Allow 20-25 minutes for the polyethylene to be exposed to the direct sunlight.
5. Remove the polyethylene from the road surface. If no moisture is present on the under side of the polyethylene or on the road surface, the tape can be applied.
6. If any moisture is present, allow another hour to pass and repeat the test until no moisture is found.

### **2527.03, B, Removal of Pavement Markings**

**Replace** the second sentence of the third paragraph:

Tightly adhering markings may remain in the bottom of the tining and other depressions on the pavement surface but shall not be visible to the motorist during daytime or night time.

### **2527.03, D, Limitations**

**Add** a new fourth paragraph:

Before winter shutdown, the Contractor shall place edge lines and symbols.

**Replace** the eighth paragraph:

When the installation of preformed polymer pavement marking material or profiled pavement marking tape is in conjunction with placement of hot mix asphalt mixtures, the tape shall be inlaid by positioning on the hot mixture prior to the final rolling. The installation of the tape shall be in accordance with the manufacturer's recommendations. If grooving is specified, tape shall not be inlaid into hot asphalt.

### **2527.03, H, Defective Epoxy Paint Pavement Markings**

**Replace** the title:

**H. Defective Pavement Markings.**

**Replace** the first unnumbered paragraph:

Markings that are low on initial retroreflectivity up to 20%, may at the discretion of the Engineer, be accepted with a price adjustment.

**Delete** "epoxy paint" from the third paragraph.

### **2527.03, H, 1, Insufficient Film Thickness, Line Width, or Low Retroreflectivity**

**Delete** the title and entire article:

~~1. Insufficient Film Thickness, Line Width, or Low Retroreflectivity.~~

~~Repair Method. Prepare the surface of the defective epoxy paint marking using methods found in Article 2527.03 in. Surface preparation shall be performed to the extent that a substantial amount of the retroreflective glass beads are removed and a roughened epoxy marking surface remains. Repair shall be made by restriping over the cleaned surface in accordance with the requirements of these specifications and at the full thickness.~~

### **2527.03, H, 2, Insufficient Bond**

**Delete** the title and entire article:

~~2. Insufficient Bond.~~

~~Repair Method. The defective epoxy paint marking shall be completely removed and cleaned to the underlying pavement surface in accordance with the requirements of Article 2527.03. The extent of removal shall be the defective area plus any adjacent epoxy paint pavement marking material extending 1 foot (300 mm) in any direction. After surface preparation work is complete, repair shall be made by reapplying epoxy paint over the cleaned pavement surface in accordance with the requirements of these specifications.~~

### **2527.03, I, Surface Preparation for Profiled Marking Tapes**

**Replace** the title:

**I. Grooving for Pavement Markings.**

**Replace** the first sentence of the first paragraph:

When specified, pavement markings shall be placed in a groove cut into the pavement surface.



**2527.03, I, 2, Groove Depth**

**Replace** the entire article:

For profiled marking tape the grooved depth shall be 0.080 inches  $\pm$  0.010 inches (2.0 mm  $\pm$  0.03 mm).

For all other markings, the groove depth shall be as recommended by the pavement marking manufacturer.

**2527.03, I, 6, Groove Cleaning**

**Replace** the last sentence:

The surface to receive the tape shall be free from dust, dirt, or other contaminants that may interfere with the tape properly bonding.

**2527.03, I, 6, a, Moisture Test of Pavement Surface**

**Delete** the title and entire article:

~~a. Moisture Test of Pavement Surface.~~

~~1) In an area of direct sunlight where the tape will be applied, place an 18 inch x 18 inch (450 mm x 450 mm) piece of polyethylene (a green or black garbage bag can be used). There should not be any holes or tears in the polyethylene.~~

~~2) Tape down all the edges of the polyethylene sheet using duct tape or pavement marking tape. The tape should seal all the edges and not allow any air movement to get under the polyethylene.~~

~~3) Firmly tamp the tape using the tamper cart or by foot tamping.~~

~~4) Allow 20-25 minutes for the polyethylene to be exposed to the direct sunlight.~~

~~5) Remove the polyethylene from the road surface. If no moisture is present on the back side of the polyethylene or on the road surface, the tape can be applied.~~

~~6) If any moisture is present, allow another hour to pass and repeat the test until no moisture is found.~~

**2527.03, I, 7, Adhesive**

**Delete** the title and entire article:

~~7. Adhesive.~~

~~The Contractor shall apply adhesive according to the manufacturer's instructions.~~

**2527.05, A, Painted Pavement Marking**

**DISREGARD** the following change made in GS-01004:

~~Delete "of the type specified" from the first sentence.~~

**2527.05, D, Painted Symbols and Legend**

**DISREGARD** the following change made in GS-01004:

~~Delete "of the type specified" from the first sentence.~~

**2527.05, K, Grooves Cut for Tape**

**Replace** the title and entire article:

**K. Grooves Cut for Pavement Markings.**

The Engineer will measure the number of stations (meters) of Grooves Cut for Pavement Markings. This quantity will be equivalent to the number of stations (meters) measured for the pavement markings. Additional width and transition length will be incidental.

**2527.06, A, Painted Pavement Marking**

**DISREGARD** the following change made in GS-01004:

**Delete** "of the type specified," from the first sentence.

**2527.06, D, Painted Symbols and Legend**

**DISREGARD** the following change made in GS-01004:

**Delete** "of the type specified," from the first sentence.

**2527.06, K, Grooves Cut for Tape**

**Replace** the title and entire article:

**K. Groves Cut for Pavement Markings.**

For the number of stations (meters) of Grooves Cut for Pavement Markings, the Contractor will be paid the unit price per station (meter).

**Section 2528****2528.01, Description**

**Replace** the sixth and seventh paragraphs:

All Category I and Category II traffic control signs and devices used on Interstate and Primary Road projects shall meet National Cooperative Highway Research Program (NCHRP) Report 350. Category I devices are defined as low mass, single-piece traffic cones, tubular markers, single-piece drums, and delineators. No lights or signs may be attached to these devices in order for them to meet the Category I limitations. Category II devices are defined as vertical panels, Type I, II, and III barricades; and moveable skid mounted sign stands.

It shall be the responsibility of the Contractor to provide the vendor's self-certification for Category I devices and the FHWA NCHRP 350 approval memos for Category II signs and devices, to the Engineer to document crashworthiness of their Category I and II traffic control signs and devices. A list of approved Category II traffic control devices is found on the World Wide Web at the following URL:  
<http://safety.fhwa.dot.gov/fourthlevel/hardware/wzd.htm>.

**2528.01, B, Traffic Quality Control**

**Replace** the last paragraph:

The Contractor shall have a technician on staff that has attended and passed the exam in an ATSSA Traffic Control Technician or International Municipal Signal Association (IMSA) Work Zone Traffic Control training class even though the Traffic Control portion of the contract may be subcontracted. This Traffic Control Technician shall be responsible for the overall management of the contractor's quality control program for traffic control.

**2528.02, 3**

**Add** as new item 3 in numbered list:

3. 2 1/4 or 2 1/2 inch (60 mm or 65 mm) square 12 gauge perforated steel tubing.

**2528.03, Channelizing Devices.**

**Replace** the word "Devises" with "Devices" in the article.

**2528.03, A, Barricades.**

**Replace** the entire article:

**A. Barricades**

Type II Barricades shall be used for all pavement surfaces on Interstate and multilane roadways which includes travel lanes, intersections, ramps, acceleration and deceleration lanes, crossovers, and shoulders. At locations other than on Interstate and multilane divided roadways, Type I barricades may be used. At any

location Type II barricades may be substituted for Type I barricades. Type I and Type II barricades shall have a minimum length of rail of 2 feet (0.6 m).

When Type I or Type II Barricades are furnished as one of the options for channelizing devices in lieu of vertical panels, 42 inch (1050 mm) channelizers, cones, or drums, a 2 foot (0.6 m) minimum length barricade may be used.

Type III barricades shall be used where specifically required. They shall have a minimum length of rail of 4 feet (1.2 m). When used as a shoulder barricade, the minimum barricade is acceptable. Unless otherwise shown in the contract documents, other Type III barricades shall have a minimum effective length of rail of 8 feet (2.4 m), including locations where the barricades are staggered to permit construction or local traffic. Barricades of the minimum length may be used, side by side and rigidly fastened together by bolting or other approved methods, to make this effective length.

Type III barricades shall have a minimum length of rail of 6 feet (1.8 m). When traffic is permitted in each direction around a Type III Barricade, the Type III Barricade used shall have fully reflectorized faces on both sides of the rails.

Barricades shall be erected in essentially a horizontal position perpendicular to the direction of approaching traffic. When placed on the traveled way or shoulder, they shall be ballasted with sandbags placed so as not to cover any striped rail.

Barricades placed on the traveled way or shoulder shall be spaced at intervals of 20 feet (6 m) on horizontal curves with a radius of 300 feet (90 m) or less, 50 feet (15 m) on horizontal curves with a radius of 300 feet (90 m) to 1,000 feet (300 m), and 300 feet (90 m) on other sections.

Shoulder barricades shall be erected within 2 feet (0.6 m) of the traveled way.

#### 2528.04, Pilot Cars

##### Replace the entire article:

Pilot cars shall be pickup trucks or automobiles carrying displaying the Contractor's company insignia, equipped with G20-4 signs reading: PILOT CAR - FOLLOW ME. Two signs shall be mounted on the vehicle so as to be clearly visible from both directions of traffic. The bottoms of the signs shall be mounted at least 1 foot (0.3 m) above the top of the cab vehicle's roof.

Pilot cars shall be operated such that they maintain a uniform speed through the work area, no greater than 40 miles per hour (65m/hr).

#### 2528.08, Temporary Floodlighting

##### Delete the first and second sentence of the first paragraph:

Floodlighting may be required. Floodlights will be required at the approximate locations shown in the contract documents.

##### Replace the third paragraph:

Temporary floodlighting shall consist of either a pole-mounted luminaire or a luminaire mounted on portable equipment. The mounting height of luminaires shall be not less than 35 feet (11 m) above the roadway, and as shown in the contract documents. The Contractor shall determine pole length by field measurement to obtain specified mounting height. Poles shall be placed outside the normal shoulder line at the approximate locations shown in the contract documents.

##### Add as first and second sentence of fourth paragraph:

Above ground lighting circuits shall be aluminum or A.C.S.R. triplex. Underground lighting circuits shall be type U.S.E. or U.F.

**2528.13, A, 5, Temporary Floodlighting**

**Add** as second sentence of the article:

This payment shall be full compensation for furnishing, installing, maintaining and servicing the temporary floodlighting units, all costs for electrical energy, and the cost of removing all lighting materials from the construction site.

**Section 2529****2529.02, B, 6, Water Reducer**

**Replace** the first sentence:

A water reducing admixture may be used at the Contractor's option.

**Section 2530****2530.03, B, 4, a, Slump**

**Replace** "(100 m)" with "(100 mm)" in the last sentence.

**2530.03, B, 4, d, Cement**

**Replace** the first paragraph:

Cement for Class M concrete mixtures shall meet the requirements of Section 4101, except that Class F fly ash, Type IP cement, or Type I(PM), IS, and I(SM) cement shall not be used in Class M patching concrete unless approved in Materials I.M. 401.

**2530.03, B, 4, f, Water Reducer**

**Replace** the first sentence:

A water reducing admixture may be used at the Contractor's option.

**Section 2535****2535.06, B, Backfill**

**Replace** the first paragraph:

Granular backfill furnished will be measured in cubic yards (cubic meters) or in tons (megagrams), as indicated in the contract documents and as provided in Article 2402.12, D.

**Section 2544****2544.05, Limitations**

**Replace** the second sentence of the first paragraph:

Except when this work is in preparation for a seal coat or slurry seal, crack filling will not be allowed on pavements from June 15 to September 15.

**Section 2546****2546.04, B, Concrete Grout for Gabions**

**Replace** "Article 2507.04, B" with "Article 2507.04".

**2546.05, B, Concrete Grout for Gabions**

**Replace** "Article 2507.04, B" with "Article 2507.04".

## Division 26. Roadside Development.

### Section 2601

#### 2601.01, Description

**Replace** "Section 2525" with "Section 2602" in the sentence.

#### 2601.05, A, Stabilizing Crop Seed Mixtures

**Replace** the second line under "Summer -- May 21 to July 20":  
Annual Rye      35 lbs. per acre (39 kg/ha)

#### 2601.06, B, Application of Mulch

**Replace** the second sentence:

The application rate for reasonably dry material shall be approximately 1 1/2 tons per acre (3.5 Mg/ha) of dry cereal straw, 2 tons per acre (4.5 Mg/ha) of wood excelsior, or 2 tons per acre (4.5 Mg/ha) of prairie hay, or other approved material, depending on the type of material furnished.

#### 2601.22, Basis of Payment

**Delete** "Mulching," from the first indented paragraph.

**Add** a new sixth indented paragraph:

For the quantity of mulch furnished and placed, the Contractor will be paid the predetermined contract unit price per acre (hectare).

### Section 2602

#### 2602.01, Description

**Replace** the first sentence of the second paragraph:

Projects that are regulated by the requirements of Iowa DNR National Pollutant Discharge Elimination System (NPDES), General Permit No. 2, for Storm Water Discharge Associated with Industrial Activity for Construction Activities, will be identified in the contract documents.

#### 2602.03, Construction

**Replace** the first sentence of the second paragraph:

The Contractor shall provide immediate, permanent, or temporary water pollution control measures to prevent contamination of adjacent watercourses and property.

**Delete** the third sentence of the second paragraph:

~~Disturbed areas shall be seeded and/or mulched as the excavation proceeds, to the extent considered desirable and practicable.~~

**Replace** "as directed by the Engineer" with "as determined by the Contractor" in the second sentence of the third paragraph.

**Delete** "as soon as conditions permit or as directed by the Engineer" in the last sentence of the fourth paragraph.

**Replace** "directed" with "approved" in the last sentence of the fifth paragraph.

**Delete** the sixth paragraph:

~~Under no conditions shall the surface area of erodible earth material exposed at one time by clearing and grubbing, excavation, borrow, or fill within the right of way exceed 750,000 square feet (70,000 m<sup>2</sup>), without approval by the Engineer.~~

**Replace** the sixth paragraph:

The Contractor shall limit clearing and grubbing, excavation, borrow, and embankment operations in progress to an area, commensurate with their capability and progress in keeping the finish grading, mulching, seeding, and other pollution control measures current in accordance with the accepted work schedule. The Engineer may suspend operations if the Contractor fails to provide adequate erosion control measures in a timely manner.

#### **2602.05 Basis of Payment**

**Replace** the second paragraph:

When it is necessary for the Contractor to clean out, repair, or reconstruct a silt ditch, dike, or basin, the additional payment will be 100% of the contract unit price for construction of that item. When applicable bid items are not in the contract documents, payment for clean out, repair, or reconstruction will be in accordance with Article 1109.03, B.

### **Section 2610**

#### **2610.03, I, Plant Establishment Period and Replacement**

**Replace** "Article 2610.07" with "Article 2610.03, E" in the fourth and seventh paragraphs.

#### **2610.05, Basis of Payment**

**Delete** the last sentence:

~~If the substitute is not a contract item, payment will be made as extra work in accordance with Article 1109.03, B.~~

### **Section 2611**

#### **2611.01, Description**

**Replace** "Article 2610.03, 2610.06, 2610.07, or 2610.08" with "Article 2610.03, A; 2610.03, D; 2610.03, E; or 2610.03, F".

#### **2611.05, A, After Initial Installation is Complete**

**Replace** "75%" with "65%" in the first sentence.

## **Division 41. Construction Materials.**

### **Section 4101**

#### **4101.01, General Requirements**

**Replace** the entire article:

##### **A. ASTM C 150 Cements.**

Unless otherwise specified, Portland cement shall meet the requirements of ASTM C 150 and the following requirements:

1. The maximum percent sulfur trioxide (SO<sub>3</sub>) shall be 3.0% for Type I and Type II cements and ASTM C 150 Table 1, Note D, shall not apply.
2. The alkali content expressed as total equivalent sodium oxide shall not be more than 0.60% for all cements.

##### **B. ASTM C 595 Cements.**

Unless otherwise specified, blended hydraulic cement shall meet requirements of ASTM C 595 and the following requirements:

1. The pozzolan constituent of Type IP cement shall not be more than 20 weight (mass) percent of the Portland-pozzolan cement.
2. The maximum sulfur trioxide (SO<sub>3</sub>) for Type IP and Type I(PM) cements shall be 3.5% and ASTM C 595 Table 1, Note B, shall not apply.
3. The slag constituent of Type IS cement shall not be more than 35 weight (mass) percent of the Portland blast-furnace slag cement.
4. Type IP or I(PM) cement shall not contain Class C fly ash.
5. Blended cements produced with Type I clinker or Type I cement shall contain 35% ground granulated blast furnace slag. All other blended cements shall be produced with Type II clinker.

### C. Cement Type Usage.

Unless otherwise specified, cement type and usage in various pavements, structures, and other elements shall be as follows:

1. Type II cement shall be used in Interstate and Primary pavements, except for quantities less than 3600 square yards (3000 m<sup>2</sup>) furnished as transit mix concrete.
2. Type I or Type II cement may be used for all other applications. Type III cement may be used in precast and prestressed concrete only.
3. Type IP, Type I(PM), Type IS, or Type I(SM) cement may be furnished at the Contractor's option when Type I or Type II cement is specified. Type I cement with 35% substitution by weight of ground granulated blast furnace slag may be furnished at the Contractor's option when Type II cement is specified. The limitations of Articles 2301.04, 2403.03, or 2412.02 shall apply.
4. The unit volume of Type IP, Type I(PM), Type IS, or Type I(SM) cement in the concrete shall be that specified for Type I or Type II cement, unless otherwise specified.

Cement which contains 5.0% or more of lumps retained on a No. 20 (850 µm) sieve will be rejected. Cement which contains less than 1.0% of lumps may be used without adjustment in the batch. For each 1.0% or fraction thereof from 1.0% to 5.0% of lumps found by test, batch weights (mass) of cement used in either concrete pavement or structural concrete shall be increased by 2.0% of the original value.

Air entrainment of the concrete is to be accomplished by the addition, at the time of mixing, of as approved air entraining admixture specified in Section 4103. Air entraining cement shall not be used.

## Section 4109

### 4109.02, Testing Sieves

Add gradation to the Aggregate Gradation Table:

Grad. No.	Section No.	Intended Use	3/8" (9.5 mm)	4 (4.75 mm)	8 (2.36 mm)	30 (600 µm)	50 (300 µm)	100 (150 µm)	200 (75 µm)	Note
22	4125.02 B	Fine Slurry Mixture	100	85-100	40-95	20-60	14-35	10-25	5-25	10

**Replace** "Slurry Tr." with "Coarse Slurry Mixture" in Grad. No. 23 on the Aggregate Gradation Table.

**Replace** "75-100" with "75-90" in Grad. No. 31, Sieve Sz. 0.500" (12.5 mm) on the Aggregate Gradation Table.

**Delete** Gradation No. 34:

~~34. 4130.05 {6" Cr. St.} Erosion Stone 100% passing the 9" screen - 100% retained on the 3" sieve.~~

~~34. 4130.05 (152.4 mm Cr. St.) Erosion Stone 100% passing the 228.6 mm screen – 100% retained on the 76.2 mm sieve.~~

**Add** Note 10 to Aggregate Gradation Table:

10. Gradation limitations for the 30, 50, and 100 (600 µm, 300 µm, and 150 µm) sieves shall not apply when slurry mixture is applied by hand lutes such as for slurry leveling.

**Replace** “and 33” with “33, and 34” in the “Notes:” at the end of the chart.

**Section 4115**

**4115.03, C, Maximum Permissible Amounts of Objectionable Material**

**Replace** “Clay lumps” with “Clay lumps and friable particles” as the first item in the chart.

**4115.04, C, Requirements for Use**

**Replace** the fifth and sixth sentences of the first paragraph:

Class 3 durability or better will be required for all prestressed concrete units. Class 2 durability or better will be required for structural concrete and all precast concrete units, in accordance with Section 2403 and Section 2407, respectively.

**Replace** the sixth line in Table 4115.04:

**Insert** a new seventh line in Table 4115.04:

Specification Number	Minimum Durability Class Required			Use
	3i	3	2	
2407 (See 2407.03)			X	Precast Units
2407 (See 2407.03)		X		Prestressed Units

**Delete** the ~~18th~~19th entry and the first note in Table 4115.04:

TABLE 4115.04

Specification Number	Minimum Durability Class Required			Use
	3i	3	2	
<del>2517 (See 2301)</del> <del>— Interstate System</del> <del>— Primary System</del> <del>— Other*</del>	<del>X**</del>	<del>X**</del>	<del>X</del>	<del>Concrete Header Slabs</del>
Notes: *County, City, Park and Institutional Road Systems.				

**4115.05, Gradation**

**Replace** the table:

<u>Mix Class</u>	<u>Mix Number</u>	<u>Gradation Number</u>
<del>D57</del> <del>2 to 8</del> A, B, C <del>M</del> A, B, C, M	<del>57, 57-6</del> 2 to 8, <del>V47B</del> <del>4</del> V	3 or 5 3, 4, or 5 <del>3, 4, or 5</del> <del>7</del>

**Section 4120**

**4120.03, Class C Gravel**

**Replace** “mud balls” with “clay lumps and friable particles” in the second item in the chart.



**4120.04, Class A Crushed Stone**

**Replace** “mud balls” with “clay lumps and friable particles” in the first item in the chart.

**4120.06, Class D Crushed Stone**

**Replace** “mud balls” with “clay lumps and friable particles” in the last sentence.

**Section 4121****4121.01, A, Abrasion and Clay Content**

**Replace** “45%” with “50%” in the first sentence.

**Section 4123****4123.01, Description**

**Replace** the second paragraph:

Recycled crushed PCC pavement, crushed composite pavement, and salvaged HMA shall be reclaimed from an Interstate or Primary roadbed under the jurisdiction of the Contracting Authority. Recycled PCC roadway pavement or recycled composite roadway pavement obtained from secondary roads or municipal streets may be used if the source of the aggregate is known and the PCC coarse aggregate durability is class 2 or better. When the source or quality of the material from the secondary or municipal pavement is unknown, the material shall meet the requirements of 4123.01 A. Certified RAP, recycled PCC pavement, or recycled composite pavement obtained from other sources may be used.

**Section 4125****4125.01, B, 3, Gradation**

**Replace** the entire article:

The composite aggregate, excluding mineral filler, shall meet requirements for Gradation No. 22 or No. 23 of the Aggregate Gradation Table referenced in Section 4109.

**Section 4127****4127.03, Fine Aggregate**

**Replace** “lumps, balls of clay” with “clay lumps and friable particles” in the second paragraph.

**4127.04, Coarse Aggregate**

**Add** as the first sentence of the fifth paragraph:

Coarse aggregate abrasion loss shall not exceed 45% as determined in accordance with AASHTO T 96.

**Replace** “mud and clay balls” with “clay lumps and friable particles” in the last sentence of the fifth paragraph.

**Section 4130****4130.01 Description**

**Add** as the last item in the fourth indented paragraph which starts with “For all projects”:

For Erosion Stone: 15%, Method C.

**4130.02 Class A Revetment**

**Replace** the entire article:

Individual stones of Class A revetment shall weigh not less than 50 pounds (25 kg) and not more than 400 pounds (180 kg). At least 75% of the stones shall weigh more than 75 pounds (35 kg). The Engineer shall visually examine selected samples of Class A Revetment. The stones shall have at least one flat face with one dimension at least 15 inches (375 mm).

Revetment shall have a nominal top size of 400 pounds (180 kg) and meet the following size limitations:

<u>Stone Weight, lbs. (Mass, kilograms)</u>	<u>Minimum % Larger Than Stone Weight (Mass)</u>
75(35)	75
50(25)	100

**4130.03 Class B Revetment**

**Replace** the sentence:

The Engineer will visually examine selected samples of Class B revetment. Revetment shall have a nominal top size of 650 pounds (300 kg) and meet the following size limitations:

**Delete** the first item in the table:

~~650 (300) — 0~~

**4130.05 Erosion Stone or Buttress Stone**

**Replace** the entire article:

Stone for erosion control or as a buttress shall consist of a nominal 6 inch (150 mm) mixture, by visual examination, with 100% passing the 9 inch (225 mm) screen and 100% retained on the 3 inch (75 mm) screen. The stone shall meet the requirement **5** of Article 4130.01, and not **have** more than 5% maximum clay lumps and friable particles.

**Section 4131****4131.02 Quality**

**Replace** the first sentence:

Aggregate for this material shall be limestone and/or dolomite or gravel; free of visible clay lumps, friable particles, and objectionable clay coating.

**Section 4137****4137.02, Asphalt Binder**

**Replace** "AASHTO MP1" with "AASHTO M 320" in the article.

**Add** as the second paragraph:

Modification of asphalt binders by addition of acids will not be allowed.

**Section 4152****4152.02, Structural Steel**

**Replace** "(20 at 4" with "(20 at 4)" in the third line of Minimum Average Energy column of Table A.

**Section 4153****4153.06, B, High Strength Fasteners**

**Replace** the first sentence:

High strength bolts, nuts, and washers shall meet the requirements of the appropriate ASTM Specifications as follows: bolts - A 325, nuts - A 563 Grade DH3, and washers - F 436.

**4153.06, B, 2, a**

**Replace** entire article:

**a. Intentionally left blank.**

**Section 4155****4155.02, Formed Steel Beam Guardrail**

**Replace** the 5th, 6th, and 7th sentences:

Anchor bolts used to attach beam rail to bridge barrier rail shall meet requirements of ASTM F 1554, Grade 55, and shall be full-length galvanized. Washers shall meet the requirements of ASTM F 436. Nuts shall meet the requirements of ASTM A 563, DH, and be heavy hex, Class 2B. All other bolts, nuts, and washers shall meet the requirements of ASTM A 307, Grade A; ASTM A 563, Grade A, hex; and ASTM F 844; respectively. Galvanizing shall meet the requirements of ASTM A 153, Class C.

**4155.04, Wood Posts**

**Replace** the entire article:

Wood posts shall be sawed to the dimensions shown in the contract documents and meet requirements of Section 4164.

**4155.05 Steel Posts**

**Replace** the first sentence:

Steel posts and plates shall be galvanized ASTM A 36/A 36 M structural steel of the dimensions shown in the contract documents.

**4155.06 Miscellaneous Items**

**Change** the article number 4155.0607.

**Add** title and new article 4155.06:

**4155.06 Spacer Blocks.**

Wood spacer blocks shall meet requirements for wood posts. Steel spacers shall meet requirements for steel posts. Spacer blocks manufactured from alternate materials that have received FHWA approval for use on the National Highway System may be substituted for wood or steel spacer blocks. A list of approved spacer blocks is found on the World Wide Web at the following URL:  
[http://safety.fhwa.dot.gov/fourthlevel/pro\\_res\\_road\\_nchrp350.htm](http://safety.fhwa.dot.gov/fourthlevel/pro_res_road_nchrp350.htm)

**Section 4183****4183.03, B, 1, b, Resin Solids**

**Replace** the second sentence:

Acrylic emulsion polymer shall be Rohm & Haas E 3427 (2706), Dow Chemical DT 250, or an approved equal.

**4183.03, B, 4, Packaging and Marking**

**Replace** "(2.5°C)" with "(25°C)" in the last paragraph.

**4183.04, Epoxy Traffic Paint**

**Replace** the title:  
**Durable Paint Pavement Markings.**

**Replace** the first paragraph:  
 Durable paint pavement markings shall meet the requirements of Materials I.M. 483.04.

**Section 4185****4185.02, A, Anchor Bolt and Slip-Base Plate Fasteners for Lighting Poles**

**Replace** the second paragraph:

The anchor bolts shall meet the requirements of ASTM F 1554, Grade 105 (724 MPa), and be full-length galvanized. Anchor bolts shall be the Unified Coarse Thread Series and have Class 2A tolerance. The end of each anchor bolt intended to project from the concrete shall be color coded in red to identify the grade. Slip base plate 1 inch by 4 1/2 inch (25 mm by 112 mm) bolts shall meet the requirements of ASTM A 325, be high-strength bolts, and be fully galvanized. Washers shall be galvanized and shall meet the requirements of ASTM F 436. Nuts shall meet the requirements of ASTM A 563, DH, be heavy hex, and be galvanized. Nuts may be over-tapped in accordance with the allowance requirements of ASTM A 563. Galvanizing shall meet the requirements of ASTM A 153, Class C; or ASTM B 695, Class 50.

**Section 4186****4186.03, A, Utilization of Reflective Sheeting**

**Replace** the entire article:

**1. Permanent Signs and Devices.**

Unless otherwise specified, all signs with white, yellow, green, red, blue, or brown background shall use Type III or IV retroreflective sheeting. The legend on white and yellow signs shall be accomplished with black nonreflective sheeting that is direct applied, or silk screened with black opaque ink. The legend on green signs shall be accomplished with white Type III or IV retroreflective sheeting that is direct applied or with detachable copy. The legend on red signs shall be accomplished using either transparent red ink that is reverse silk screened on white Type III or IV sheeting, or with white type III or IV retroreflective sheeting that is direct applied on a red Type III or IV retroreflective sheeting background. The legend on blue or brown signs shall be accomplished using either transparent ink that is reverse silk screened on white Type III or IV sheeting, with white type III or IV retroreflective sheeting that is direct applied, or with detachable copy.

Type III or IV retroreflective sheeting shall be used for permanent road closure barricades.

**2. Work Zone Signs and Devices.****a. Interstate and Primary Highways.**

Unless otherwise specified, all rigid signs with orange backgrounds shall use Type VII (Iowa) retroreflective sheeting. The legend shall be accomplished with black nonreflective sheeting that is direct applied or silk screened with black opaque ink. Unless otherwise specified, all flexible roll-up signs with orange backgrounds shall use Type VI (Iowa) retroreflective sheeting. The legend shall be accomplished by silk screening with black opaque ink.

STOP/SLOW and SLOW/SLOW paddles shall use Type VII (Iowa) retroreflective sheeting. The black legend shall be accomplished with black nonreflective sheeting that is direct applied or silk screened with black opaque ink. The white legend shall be accomplished with transparent red ink that is reverse silk screened on white Type VII (Iowa) retroreflective sheeting.

Type III or IV retroreflective sheeting shall be used for barricades and vertical panels. Reboundable drums, tubular markers, and other reboundable markers shall use Type III or IV retroreflective sheeting that is designed for reboundable devices.

**b. Other Highways.**

Unless otherwise specified, all rigid post mounted signs with orange backgrounds shall use Type III or IV retroreflective sheeting. Unless otherwise specified, all skid mounted signs with orange backgrounds

shall use Type I or II retroreflective sheeting. The legend shall be accomplished with black nonreflective sheeting that is direct applied or silk screened with black opaque ink.

STOP/SLOW and SLOW/SLOW paddles shall use Type I or II retroreflective sheeting. The black legend shall be accomplished with black nonreflective sheeting that is direct applied or silk screened with black opaque ink. The white legend shall be accomplished with transparent red ink that is reverse silk screened on white retroreflective sheeting.

Type III or IV retroreflective sheeting shall be used for barricades and vertical panels. Reboundable drums, tubular markers, and other reboundable markers shall use Type III or IV retroreflective sheeting that is designed for reboundable devices.

At the Contractor's option, work zone signs and devices using retroreflective sheeting in accordance with Article 4186.03, A, 2, a above, may be used on all other highways.

#### **4186.09, A, Type A Signs**

##### **Replace entire article:**

##### **A. Type A Signs**

Type A sign fasteners shall be as follows:

##### **1. Bolts.**

Bolts shall be 3/8 inch (9.5 mm) in diameter with a hexagonal head, ~~manufactured from aluminum wire or rod meeting requirements of ASTM B 211 Alloy 2024-T4.~~ Thread fit shall conform to ANSI Class 2A. The length required shall be dependent upon the type of post supplied by the Contractor (wood, steel or aluminum). The minor thread diameter shall be used in determining stress area.

##### **2. Nuts.**

Nuts shall be finished, finished thick, regular, or heavy, hexagonal, self locking nuts for 3/8 inch (9.6 mm) bolts, but all nuts shall be of the same type. ~~Nuts shall be manufactured from any aluminum alloy listed in ASTM B 211 or from stainless steel.~~ The axial tensile strength at room temperature shall be not less than 4,730 pounds (21 kN).

##### **3. Self Locking Nuts.**

Self locking nuts shall be approved by the Engineer. Thread fit shall be as recommended by the manufacturer.

##### **4. Washers.**

Washers shall be made of a quality of material approved by the Engineer. The washers shall be ~~7/16 3/8~~ inch ~~(11 9.5 mm)~~ I.D. x 1 ~~3/8~~ inch ~~(25 35 mm)~~ O.D. x ~~0.078 0.125~~ inch ~~(2 3 mm)~~. A thickness tolerance of  $\pm 0.006$  inch (0.15 mm) will be allowed.

Neoprene washers shall be ~~7/16 3/8~~ inch ~~(11 9.5 mm)~~ I.D. x ~~3/4 15/16~~ inch ~~(19 24 mm)~~ O.D. x 1/8 inch (3 mm) thickness. (Neoprene washers are required when treated wood posts are used). Durometer hardness shall be 60 to 70 with a tolerance of  $\pm 5$ .

##### **5. Other Details.**

Other details, including post clips on I-beams posts, etc., are shown in the contract documents.

~~Though aluminum hardware is specified, equivalent h~~ Hardware may be furnished in stainless steel or galvanized steel as approved by the Engineer. Galvanizing shall meet requirements of ASTM A 153, Class D, or ASTM B 633, Class Fe/Zn 12, Type 1.

#### **4186.10, B, Steel Breakaway Posts for Type B Signs**

**Replace** the fifth sentence of the first paragraph:

The coating shall be applied by the hot dip process in compliance with ASTM A 123, Grade 85.

**Replace** the fifth paragraph:

Bolts (including the entire length of the anchor bolts), nuts, and washers, shall be galvanized according to ASTM A 153, Class A coating.

### **Section 4187**

#### **4187.01, Description**

**Replace** the first paragraph:

Materials for aluminum alloy or galvanized overhead sign support structures shall meet the following requirements:

#### **4187.01, B, Reserved**

**Replace** the title and paragraph:

##### **B. Materials for Galvanized Steel Superstructures.**

Materials for galvanized steel superstructure shall be of the type and quality specified in the contract documents.

#### **4187.01, C, Fasteners for Aluminum Alloy**

**Replace** the title:

##### **C. Fasteners for Aluminum Alloy and Galvanized Steel Superstructures and Anchor Bolts.**

#### **4187.01, C, 2, Anchor Bolts, Nuts, and Washers**

**Replace** all paragraphs of item 2:

The anchor bolts shall meet the requirements of ASTM F 1554, Grade 105 (724 MPa), and be full-length galvanized. Anchor bolts shall be the Unified Coarse Thread Series and have Class 2A tolerance. The end of each anchor bolt intended to project from the concrete shall be color coded in red to identify the grade. Washers shall be galvanized and shall meet the requirements of ASTM F 436. Nuts shall meet the requirements of ASTM A 563, DH, be heavy hex, and be galvanized. Nuts may be over-tapped in accordance with the allowance requirements of ASTM A 563. Galvanizing shall meet the requirements of ASTM A 153, Class C; or ASTM B 695, Class 50.